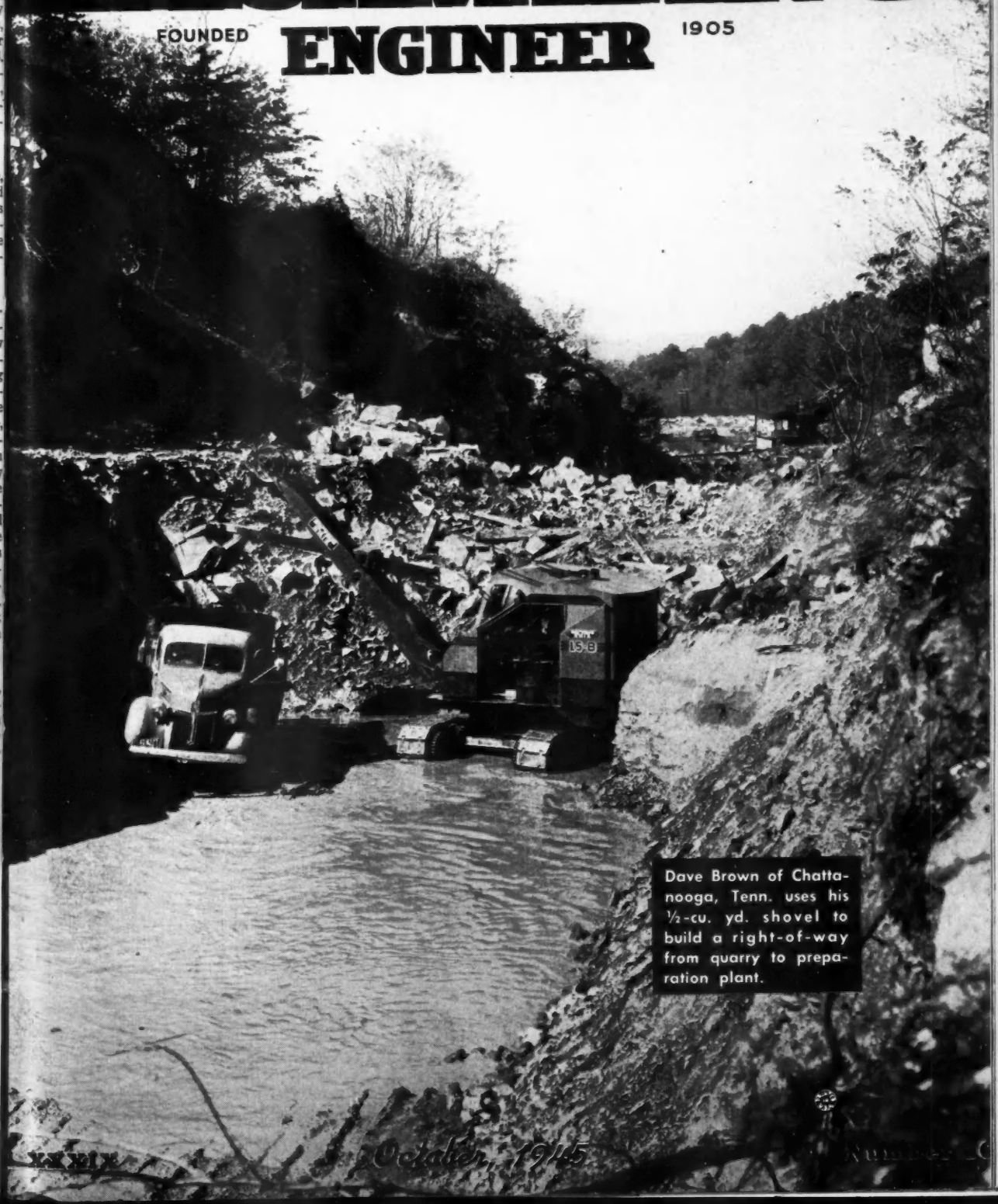
TRANSPORTATION LIBRARY

# EXCAVATING ENGINEER

FOUNDED 1905



Dave Brown of Chattanooga, Tenn. uses his ½-cu. yd. shovel to build a right-of-way from quarry to preparation plant.

XXXIX October, 1945 NUMBER 10

# Designed for Digging

Working with the intimate knowledge of field problems that comes only from years of experience and with ample modern facilities for research and manufacture at their command, Bucyrus-Erie engineers are in an unequalled position to design machines scientifically adapted to the work to be done. Every part of a Bucyrus-Erie, whether made in our own shops and foundries or purchased from an outside supplier, must pass our rigid laboratory tests before being released for production.

Study the design of a modern Bucyrus-Erie, watch the smoothness with which the machine works, and you will readily recognize that there are no design "compromises" to pile up power consumption, result in excessive maintenance, or reduce output. From the ground up, Bucyrus-Eries are designed for digging. That's why leading operators all over the world say that Bucyrus-Eries are "years ahead."

4L45C

**SOUTH MILWAUKEE, WISCONSIN**

# EXCAVATING ENGINEER

FOUNDED 1905

CONTENTS

Vol. XXXIX **October, 1945** No. 10


## October Advertisers


Allis-Chalmers Mfg. Co. ..... 539
American Agile Corporation .. 578
American Chain & Cable Company, Inc. .....3rd Cover
Barber-Greene Co. ..... 568
Blaw-Knox Company ..... 583
Bucyrus-Erie Company ..2nd Cover, 541, 560-561, 566, 567
Buda Company, The ..... 543
Caterpillar Tractor Co. ..... 544
Donaldson Company, Inc. .... 582
Ensign-Bickford Company, The. 569
Erie Steel Construction Co. ... 576
Euclid Road Machinery Co., The ..... 534
For Sale (Classified) .....591, 592
Gar Wood Industries, Inc. .... 542
Gatke Corporation ..... 574
General Electric Company ..... 563
General Excavator Co., The ... 538
General Tire & Rubber Co., The 535
Goodyear Tire & Rubber Co., The ..... 530
Hoiss Manufacturing Co., Inc. George ..... 579
Hayward Company, The ..... 566
Hodgman Rubber Company ... 531
Hyster Company .....536-537
Ingersoll-Rand Company ..... 579
International Harvester Co. ... 559
John Co., C. R. ..... 590
Koehring Company ..... 573
LaCrosse Trailer & Equipment Co. ..... 570
Leschen & Sons Rope Co., A. ... 575
LeTourneau, Inc., R. G. ...584-585
Linn Manufacturing Corp., The 580
Macwhyte Company ..... 589
Northwest Engineering Co. .... 533
Onan Sons, D. W. ..... 583
Osgood Company, The ..... 538
Owen Bucket Company, The .. 572
Preformed Wire Rope Information Bureau ..... 532
Rodgers Hydraulic, Inc. ..... 545
Roeblina's Sons Co., John A... 540
Rogers Brothers Corporation .. 566
Sauerman Brothers, Inc. ..... 577
Shunk Manufacturing Co. .... 583
Sight Feed Generator Co., The. 566
Socony-Vacuum Oil Co., Inc. .....564-565
Templeton-Kenly & Co. ..... 580
Timken Roller Bearing Co., The 571
United States Steel ..... 577
U. S. Treasury Dept. .... Bonds 587
Wellman Engineering Co., The. 570
Westinghouse Electric Corporation ..... 581
Wico Electric Company...4th Cover
Yuan Dragline Bucket Co. ... 586



**They Paved Motoyama Volcano— By R. P. Day** ..... 546
Moving 5,000,000 cu. yds. of earth was biggest single job in connection with building Iwo Jima's airfields. With plenty of equipment available Seabees and Army Engineers moved an average of 40,000 cu. yds. of earth per day in spite of live steam, hot soil, snipers, land mines and reinforced concrete blockhouses that had to be removed with the help of demolition charges.

**Crane Safe-load Indicator— by T. Davidson** ..... 552
Problems of applications and limitations of safe-load indicators to mobile cranes related by engineer who concludes that it will require cooperation and compromises between user, instrument manufacturer and crane designer to make use of instrument practical.

**Ex-Laffs** ..... 555

**Bridge Canyon Dam** ..... 556
Bureau of Reclamation's plans for structure that will outrank Boulder Dam in height and mass call for 4,360,000 cu. yds. of open cut excavation for the dam, 3,000,000 cu. yds. of excavation for preliminary construction of highway and railroad to dam site, and aggregate for 6,000,000 cu. yds. of concrete.

**Equipment You Ought to Know About** .... 558
Safety Splice ..... 558
Snow Cruisers ..... 558
Cable Controlled Bulldozer ..... 558
Band Back Stop ..... 558
Electrode Holder ..... 558

**Shots from the Firing Line** ..... 562
Additional Funds Needed for Local Public Works ..... 562
Kansas Highway Contracts Ready for Award.. 562
Rae and Foster Named to Montana Commission 562
Future Army Contracts on Competitive Basis.. 562
Hockensmith New Director of WPB Construction Bureau ..... 566
Quick Work of Contractors Helped Develop Bomb ..... 568
Schedule AED Distributors' Meetings for Fall Months ..... 568
Keenan to Spearhead Construction Program... 568
Group to Promote Inter-Regional Highway Program ..... 570
Ask Names for Advisory Group on Surplus Equipment ..... 570
Official Word Needed to Start Highway Program ..... 572
Sahara Establishes Nine Scholarships at Illinois 574
Award Contract on Deschutes Job ..... 575
Colonel Renshaw District Engineer of New York 575
Texas to Build 2,162 Miles of Roads in 12 Months ..... 576
Form Agricultural Division of Crushed Stone Group ..... 578
New York Expects to Complete $35,000,000 of Road Plans ..... 578
Start Construction of Maine Turnpike Next Spring ..... 578
Crushed Stone Association Safety Competition 579

**Obituaries** ..... 580
Charles E. Carey ..... 580
Lloyd Sumner Burdick ..... 580

**Not in the Contract** ..... 588

**Notes from the Manufacturers** ..... 592

**New Trade Literature** ..... 592



Published Monthly by
THE EXCAVATING ENGINEER PUBLISHING COMPANY
South Milwaukee, Wisconsin, U. S. A.

F. O. WYSE, Publisher
J. D. GRACE, Editor
D. B. REED, JR., Managing Editor
E. W. ARNDT, Art Editor
E. M. HEUSTON, Sales Manager
M. J. BARGENQUEST, Assistant Sales Manager

ECA Member Controlled Circulation Audit

Regular Subscription (payable in advance): 25 cents per copy, $2.50 a year: Canada and foreign, subject to publication policy, $3.50 per year. Special subscription: Upon written request on company letterhead this publication will be sent (not regularly) free of charge to companies, executives and supervisors engaged actively in excavating.



COPYRIGHT 1945 BY THE EXCAVATING ENGINEER PUBLISHING COMPANY



PROTECTION

*when and where—*

NEEDED MOST

**Each Hodgman garment is designed for a specific use or occupation to stand up under the most severe service conditions. All fabrics, coated in our plant, meet the most rigid government specifications. All Hodgman garments are reinforced in the proper places, are waterproof and provide the utmost in comfort. There is a Hodgman garment for almost every industrial use.**

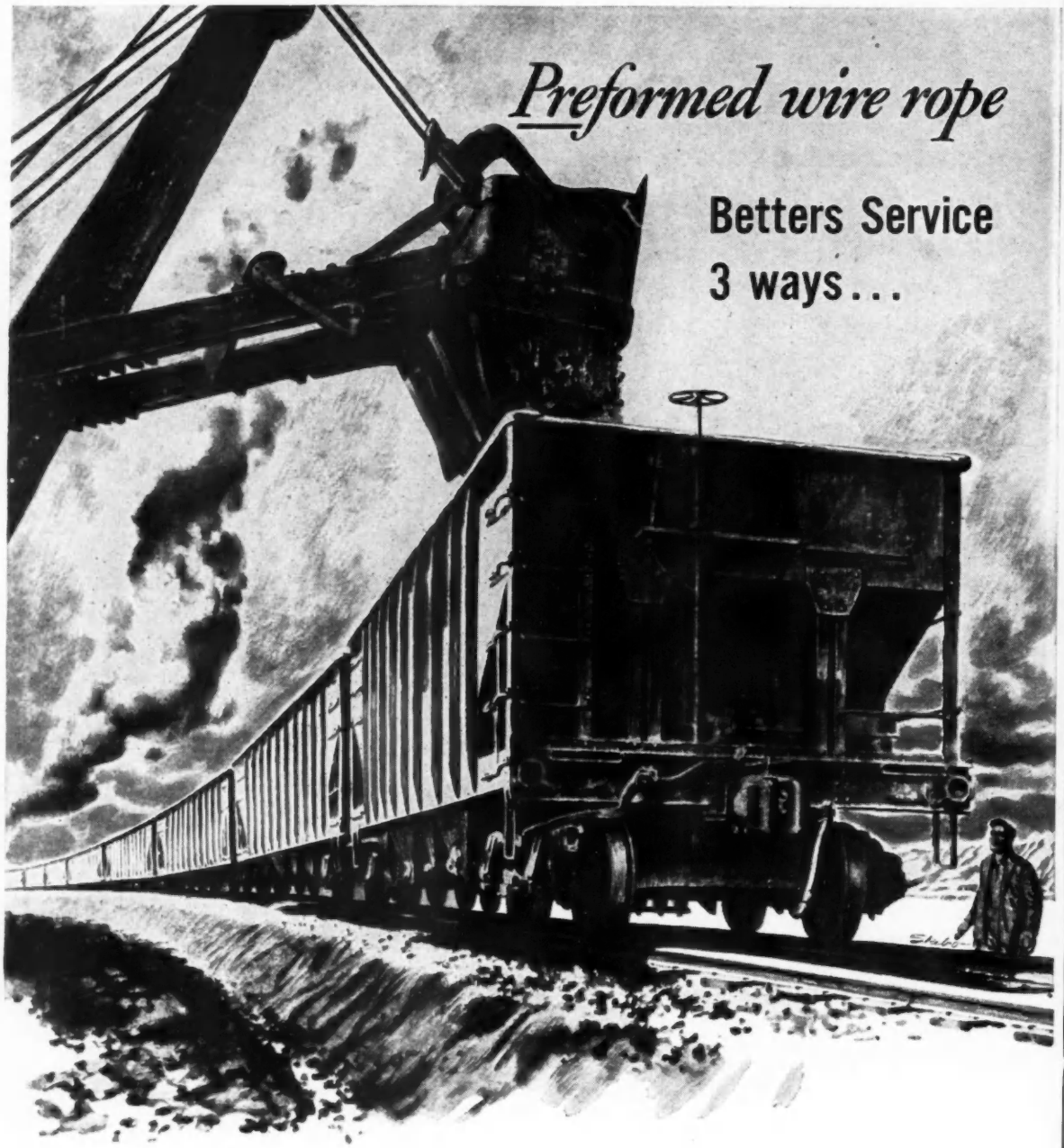
PROTECTIVE CLOTHING

Address Dept. C-4

for latest Catalogue

HODGMAN RUBBER CO.
Framingham, Mass.

New York 6 261 Fifth Ave.
Chicago 2 173 W. Madison
San Francisco 5 121 Second




RAILROADS own and operate thousands of pieces of heavy-duty equipment for which Preformed wire rope provides the muscle. Thus, Preformed is found on power shovels, cranes, derricks, hoists, winches—on car pullers, car retarders, dumpers—on loaders, unloaders, slings.

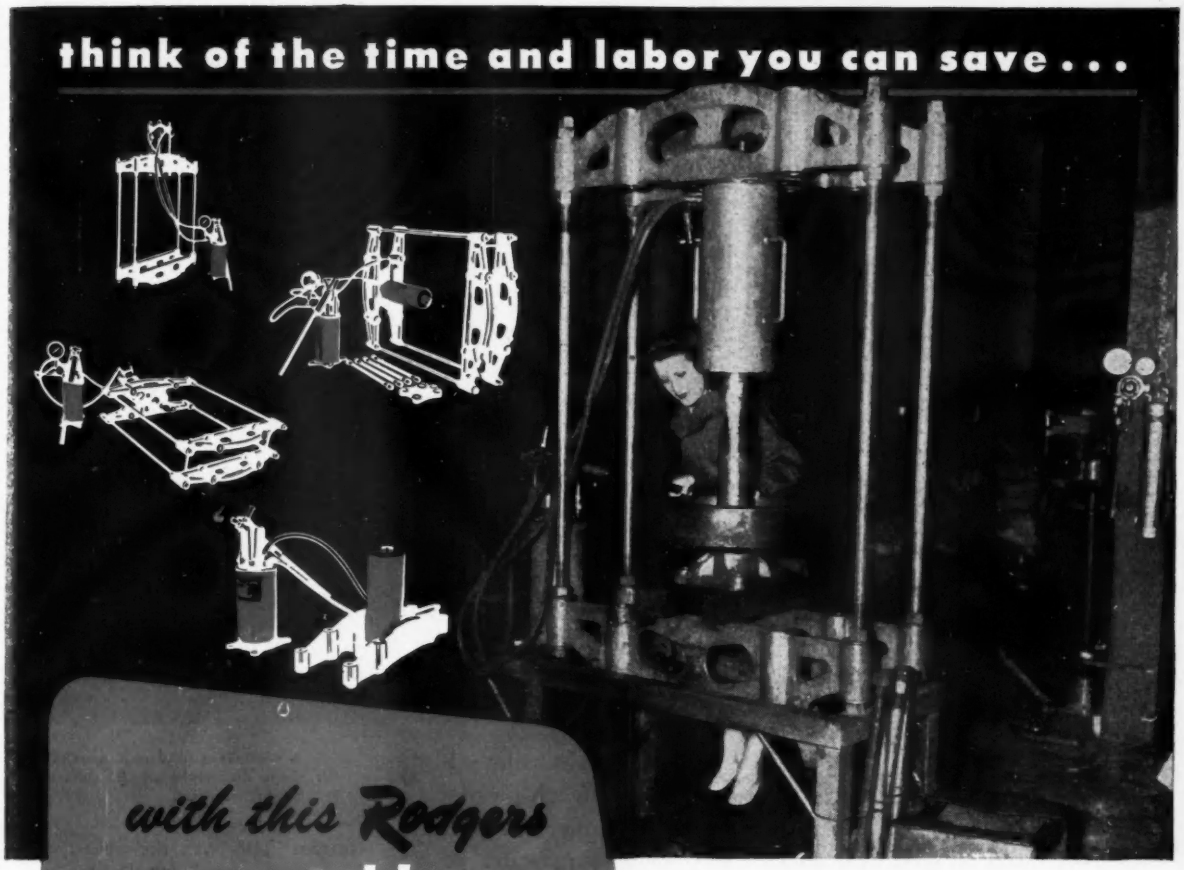
Railroads—like other industries—choose Preformed because it is *economical*, *safe*, and *saves wear* on equipment.

Its *economy* comes from longer life, due chiefly to lack of internal stress. It is *safer* for workmen because its wires lie flat when cut or broken, and because preforming relaxes wire rope and makes it flexible . . . It *saves wear* on expensive equipment because it reduces rotation on sheaves and spools evenly on drums.

Executives in *all* industries recognize the better service offered by Preformed.

***ASK YOUR OWN SUPPLIER FOR PREFORMED WIRE ROPE***

# think of the time and labor you can save . . .



## *with this Rodgers* portable hydraulic press of 100 uses . . .

Here is the handiest time-and-trouble-saving piece of equipment you can have around for maintenance, service and special jobs—any place that you may need 50 to 200 tons of easily portable hydraulic power.

The Rodgers Universal Press is the ideal answer for pulling gears, pinions and wheels: for pressing shafts, bushings and pins; for clamping and jacking operations. It is used on a stand as an ordinary press, or on its side horizontally. Tie rods are quickly disassembled to fit the press around a large piece of equipment and they may be lengthened with extension rods. Frame may be used in full or narrow width—cylinder is mounted either between upper frame members or suspended below. Tested special alloy steel assures great strength for safety and ruggedness. Power is supplied by either the Rodgers 4-speed Hand Pump or power-operated pump unit.

A Rodgers Universal will pay for itself over and over in the time and labor it will save you—we believe you will find it almost indispensable. *Write now* and let us send you all of the facts.

***Send for this interesting booklet . . .***

*It will give you complete information and details about Rodgers Hydraulic Presses. No obligation, of course, and you can profit by it.*

# Rodgers Hydraulic, Inc.

**hydraulic power equipment**

**741 Walker St., St. Louis Park, Minneapolis 16, Minn.**

# They Paved Motoyama Volcano

By
R. P. DAY
CCM, USNR

**Moving 5,000,000 cu. yds. of earth was biggest single job in connection with building Iwo Jima's airfields. With plenty of equipment available Seabees and Army Engineers moved an average of 40,000 cu. yds. of earth per day in spite of live steam, hot soil, snipers, land mines and reinforced concrete blockhouses that had to be removed with the help of demolition charges.**

SUPPOSE YOU HAD to figure costs and put in a bid on paving the top of a volcano. And then, after you had the job finished, suppose you had to guarantee it!

That is exactly what the Seabees and a few Army Engineers did at Iwo Jima. Dirt coming out of borrow pits so hot it takes the temper out of shovel teeth; Japs with rifles, lying out in the rocks shooting the tires flat on motor graders; steam coming up out of the ground so thick that scraper operators can scarcely see to dump; tractors running over enemy land mines . . . these are only a few of the "unusual" conditions, faced at one time or another by these builders.

Iwo Jima is eight square miles of black and buff volcanic ash; a battle ground strewn with scraps of steel and unexploded ordnance where nearly 5,000 Americans gave their lives so a free nation might live. Iwo is a place of weird tree trunks, sudden silences, and death. It is a place where the roar of airplane motors echoes among the gray rocks, where grim bewhiskered men drove bulldozers through the rocks while younger, cleaner looking boys hurtled fighter planes through the sky.

Iwo lies in the North Pacific Ocean and is shaped roughly like the continent of South America, with Suribachi Yama volcano at its extreme southern tip.

The island, estimated by geologists to be less than 10,000 years old, came under Japanese rule in 1891. Few white men ever saw Iwo, until the U. S. Marines poured ashore February 19, 1945. Until that day it was a secret Japanese stronghold, somber and forbidding, its black shores washed by the angry Pacific ocean.

It was an island of oriental atmosphere, where 1000 civilians fished, grew sugar cane for the 12 small sugar mills, or mined sulphur out of the hot core of old Motoyama. The Asiatic Order, administered by the Japanese, never touched Iwo Jima until 1933. Then the Jap troops and Korean laborers began to build an airfield near the village of Motoyama

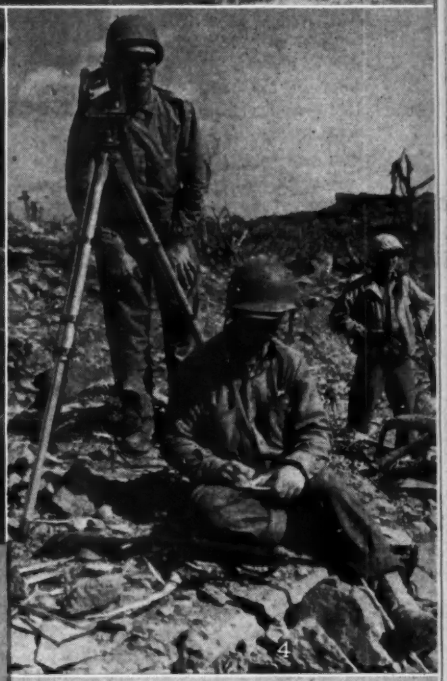
• **Shovels and dump trucks busily move dirt right on the tails of B-29 Superfortresses.**

Buraku. This was the field that the Seabees enlarged for B-29s; a field which boasts of one of the longest runways in the Pacific.

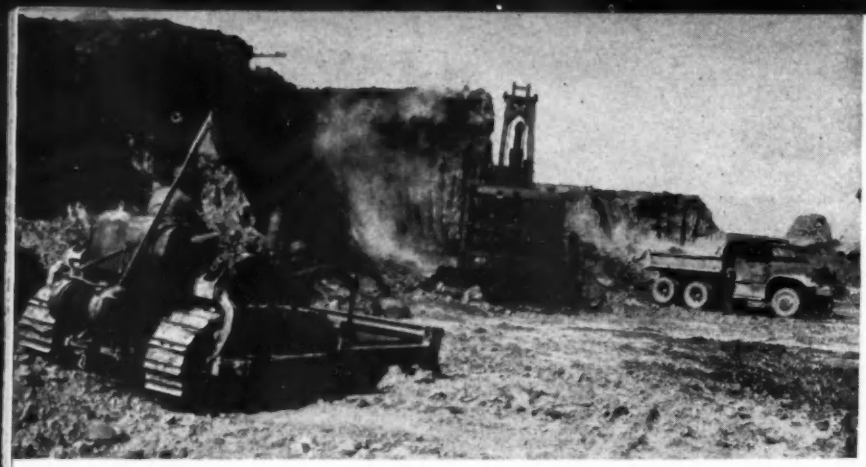
Iwo's people continued to farm, to produce perfume extracts from the roots of bechiba and lemon grass, and to work on Japanese military installations. They cut and hewed blocks of consolidated volcanic silt and hand-placed them, with a tremendous expenditure of man hours, at the base of their runway. Their surfacing was a crude grade of macadam, and traces of the hand-formed base blocks along with land mines and carefully concealed booby traps were found by Seabees.

They learned, from Japanese engineers, that a road up Mount Suribachi was impossible to build, and they lugged cement for gun emplacements on their backs up a steep, treacherous pathway.

After Japan attacked Pearl Harbor, these same civilians watched the Japs start construction on still another airport, the enlargement of which was a part of the Seabee-Army Engineer project. It seemed to these people, in 1942 and 1943, that Japan might conquer the world, but suddenly the tide was turned and the armed dagger of military might was pointed toward Iwo. Women and children and old men were evacuated in the middle of



Land mines, Jap snipers and hot volcanic material provided some of the problems faced in the construction of Iwo Jima's airfields. 1 — Lieut. Commander F. B. Campbell, CEC, USNR, inspects damage done by a land mine to one of his heavy duty scooters. 2 — These brave men are probing for land mines with bayonets fastened to sticks. Some Japanese prisoners were also used for this work. 3 — The boy with the cigarette has just been blown off his tractor by a land mine. The mine which the Japs had hooked to this dud shell, failed to explode the shell which is being removed but had sufficient wallop to tear two track plates loose. 4 — Surveyors worked with an armed guard protecting them from the Japs. 5 — This borrow pit is so hot and obscured by smoke that shovel runners had difficulties seeing how to dig and dump.



• Bucyrus-Erie Bullgrader cleans up around a 2-cu. yd. Lorain shovel.

1944. The cream of Japanese military might stayed on. They dug caves to fight the only kind of war which rats fight well: underground.

Among the first American engineers to land on Iwo was Commodore Robert C. Johnson, CEC, USNR, who as Officer in Charge of a U. S. Naval Construction Brigade had the job of locating, planning and supervising construction of big airports. Colonel D. A. Morris, Army Air Forces, was named island engineer.

Commodore Johnson and Commander Paul F. Henderson, Officer in Charge of the Naval Construction Regiment, stayed close to the Marine front lines while the fighting raged. They located airfields; mapped territory in a rough, preliminary way and studied terrain.

They came prepared for a rock job, and they got a lucky break. The formation at Iwo appeared to be solid rock on aerial photographs; in fact it appeared to be solid rock when viewed from 100 feet. It is defined geologically as a weathered volcanic ash, bedded and chemically changed by sulphurous gases passing up from the core of Motoyama. Bulldozers could dig it.

There is also a granular black ash, found in its loose state, on Motoyama plateau. Somehow Motoyama volcano flattened itself to form a rough area comprising the entire northern bulge of Iwo Jima. Pieces of coral, found in excavations at the airfields, bore out the theory that Motoyama was at one time at the bottom of the sea.

Commodore Johnson and Colonel Morris settled on a tentative airfield construction program long before the island was secured, and Seabees started to work. The Japs' Southern Airdrome consisted of a single short fighter strip, and it was planned to enlarge this field to make a fighter and medium bomber strip.

The original field, known as Central Airdrome, came in for extensive study. While the terrain, geology and wind directions were being studied, Seabees moved in. They picked up shrapnel, removed duds, and worked with ordnance disposal units getting rid of land mines and booby traps. Sniper fire harassed them. They filled bomb craters with bulldozed dirt, smoothed and widened the strip, and built on the end of it for three days. It was turned over to routine air traffic after the 72-hour construction period; before that, Marine artillery spotting planes had been using it while Seabees picked up shrapnel. The old Jap strip took as much air traffic as Fairfax Airport at Kansas City, Missouri, normally handles, for five months, with no other work except routine motor grading and smooth rolling.

Work began on March 10, 1945 on the permanent airfields of Iwo Jima. Parts of four Seabee battalions scattered themselves over the Motoyama plateau, bringing power shovels, motor graders, Bullgraders, scrapers and all the other tools of the dirt mover's craft.

### Clearing Work Difficult

Clearing was particularly difficult. For one thing, the enemy was still here. Minefields were everywhere. Dud shells littered the ground. Sniper's bullets droned around the ears of Seabees, and a few were wounded. The Jap is an unpredictable creature; one afternoon when construction had scarcely begun a Jap sniper amused himself for hours shooting the rubber tires flat on every motor grader and scraper in sight, but not one operator was hit!

Crews of ordnance experts and demolition men were busy at this time removing dud shells and land mines. Teams of Seabees ganged up with bayonets lashed to long poles, and probed for mines. Most were found and removed safely, but some earth-moving equipment was wrecked by mines.

Something about the power of American dirt - moving equipment fascinated the Japs. Many operators said they were watched at night by Japs who came out of their caves. Prisoners of war stared at bulldozers, fascinated. At least once, later in the campaign and after the island was secured, an army patrol sneaked up behind two Japs at the edge of a cliff,

• A dirt moving scoreboard — self explanatory. The sandbags protected Seabee clerks from sniper fire.

• Detail of a bituminous paving joint on one of the Motoyama airstrips.

so engrossed in the operations of a 2-cu. yd. power shovel that they failed to hear the soldiers until they were being marched off to the PW stockade.

The Seabees found to their pleasant surprise that the bedded volcanic ash which so resembled solid rock needed no drilling or shooting, and would dig with a bulldozer blade, a power shovel dipper, and after the hard crust was skimmed away, it could even be picked up by tractor-drawn scrapers. All battalion equipment which could be concentrated on the job was brought in, and on April 28 the machines of an Army Engineer Battalion were also made available. Grouped together, here is what the engineers concentrated on three airfields:

**4 Power shovels, 2-cu. yd.**
**2 Draglines, 2-cu. yd.**
**3 Power shovels, 1½-cu. yd.**
**8 Power shovels, ¾-cu. yd.**
**28 Scrapers, 8 to 16-cu. yd.**
**2 Tournapulls, 10-cu. yd.**
**10 Bulldozers**
**17 Motor graders**
**13 Sheepsfoot rollers**
**18 Smooth rollers, 5 to 8-ton, tandem**
**150 Dump trucks, 2½ to 4-yd. beds**
**13 Water sprinkler trucks**
**3 Asphalt emulsion spreader trucks**
**2 Subgrade finishers**
**2 Loaders**
**1 Asphalt plant**

The job shaped up to form three separate airdromes, which may later be joined together. Motoyama No. 1, the Southern Airdrome, has a macadamized penetration type of pavement.

Motoyama No. 2, or Central Airdrome, has two heavy bomber strips, paved with hot mix asphaltic concrete on top of a crushed rock subgrade. Central Airdrome also has a large paved fueling loop, with 150 fuel outlets.

Motoyama No. 3, the North Airdrome, is a paved single fighter strip. The Japanese had started a little bit of excavation on the site of No. 3 field when the Americans arrived, and it seemed to be the most ambitious piece of Jap dirt work yet encountered by our forces, because the topography is very rough near the north airdrome. Fifteen-foot cuts and 18-foot fills are not uncommon.

Job quantities shaped up as follows, on July 1:

**5,000,000 cu. yds. of common excavation**
**4,000,000 sq. yds. grading**
**400,000 tons asphaltic concrete aggregate to crush**
**1,300,000 sq. yds. asphaltic penetration macadam**
**1,500,000 sq. yds. asphaltic concrete 2½" thick**
**40,000 barrels emulsified asphalt**
**50,000 barrels 60-70 penetration asphaltic cement**
**1 complete fueling system**
**1 complete lighting system**

The biggest single job in connection with Iwo's airfields was the moving of earth. Usual fills and cuts were 15 feet. In extreme cases, a 41-foot fill and a 50-foot cut were made. Hauls varied. The longest truck haul was two miles one way, averaging 2500 feet ordinarily. Scrapers were used on 1000-foot one-way hauls. Tournapulls hauled 3000 feet, on the average.

**• A Barber-Greene loader does duty with a ½-cu. yd. Northwest shovel at a crushed rock stockpile.**

Because Motoyama is a volcano not entirely dead, live steam shoots up out of the ground. The soil itself is hot, never lower than 100 degrees. Soil has been tested in a place which had a natural temperature of 214 degrees Fahrenheit, and a large part of the soil the Seabees moved couldn't be handled at all with bare hands.

The resultant steam and smoke so obscured borrow pits and fills that scraper operators had a difficult time seeing how to dump, especially at night when the steam and sulphur fumes rose up like the smoke in hell. Near No. 2 Airdrome where the Seabees were building the bomber strips, steam poured out of the ground at the sulphur pit—which is believed to be Motoyama's core—in such a great quantity that the Seabees with only crude distilling apparatus were condensing 17,000 gallons of drinking water each 24-hour day.

The steam proved to be one of the hardest problems to solve. When the ground was compacted over the top of steam pockets, and then sealed with pavement, the steam condensed

**• Superfortress takes off a lighted, paved runway with scraper tire tracks still visible along the sides.**

**• Scrapers haul fill toward rough terrain in part of the bomber runway area.**

• Left to right: Commodore Robert C. Johnson, CEC, USNR; Lieut. O. L. Pickering, CEC, USNR, and Commander C. M. Herd, CEC, USNR, officials on the job.

and formed a soft spot in the subgrade. The first heavy bomber wheel to pass over these places invariably caused the pavement to fail. Then it was a case of cutting the pavement away, digging the objectionable spot out with a trench hoe, and filling it up again to a depth of about four feet with andesitic lava rock from the beaches.

### Piping Geyser

The Army Engineers, who were doing the paving on one field, found a steam geyser they couldn't stop. They excavated around it and laid a pipe off to one side of the runway, and surrounded the inlet with rocks. Steam then belched from the pipe, out at one side of the pavement, and the patch job proved successful. However, no one can say whether the strength of the rock pocket or the steam "smokestack" underneath the asphaltic concrete cured the difficulty.

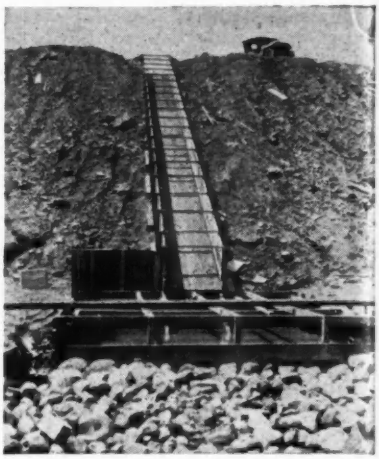
Commodore Johnson and Lieut. Commander W. J. Thompson, CEC, USN, his executive officer, considered some experimentation with French drains and weep hole pipes set flush with the pavement, believing it might let the steam out normally and still preserve the strength of asphaltic concrete paving laid down across the floor of a volcano.

Another great difficulty encountered was the presence of numerous Japanese concrete blockhouses and other defensive positions, heavily reinforced with steel bars. It was almost impossible to remove them with explosives. They occurred frequently in rocky, rough terrain through which the runways were being cut, and they had to be removed in some manner.

Demolition charges, one after another, were used. About all a demolition charge would do was to crack the concrete away from the steel. Seabees with cutting torches hacked away at the steel, more demolition charges were placed, and finally, after a great deal of trouble the blockhouses were removed in pieces about five inches on a side. Several such blockhouses, not located on an airfield site, were undermined by shovels working all around them, and left standing crookedly on a pinnacle of dirt, a grim reminder of what the Marines faced when charging these death-spitting positions.

According to many of the officers in charge, this was the first job they had seen which had plenty of power shovels and trucks available, and they are all very happy about the misinterpretation of the formation at Iwo which caused everyone to believe it was hard rock.

The 2-cu. yd. and 1½-cu. yd. shovels were used to excavate heavy cuts, and truck-dumped material was used to make heavy fills. Many of the high fills were built by the end-dump method, allowing normal settlement for compaction purposes. Every sheepsfoot roller on Iwo Jima was in use, mostly on the compaction of selected subgrade soil directly below the paving.



• This Seabee-built timber flume led runoff water down off the side of a high runway fill and prevented erosion of the slope.

The Seabees and Army Engineers moved an average of 40,000 cu. yds. of earth per day. This figure does not include the dirt pushed in place by bulldozer blades. It does include all earth picked up and moved by power shovels, trucks, and tractor drawn scrapers. The best day's performance for all units was 56,000 cu. yds. In 112 working days, 3,500,000 cu. yds. of earth was moved on the 5,000,000-cu. yd. job.

The Motoyama soil falls into five classifications: buff volcanic ash (No. 1); black volcanic ash (No. 1A); buff volcanic ash (No. 2); black volcanic ash (No. 3), and black volcanic ash (No. 4).

The soils most prevalent at all the airfield sites were buff volcanic ash (No. 2) and black volcanic ash (No. 3). Samples of these soils have been analyzed, classified and screened. Proctor soil testing equipment was made available to the battalions. Moisture curves were plotted, and sieve analyses run. The following is a sieve analysis of the most plentiful type of soil being used:

**Type of Soil**

Black volcanic ash (No. 2)

| Sieve Size | Per Cent Passing |
|---|---|
| No. 4 | 96 |
| No. 10 | 78 |
| No. 20 | 42 |
| No. 40 | 18 |
| No. 60 | 11 |
| No. 80 | 7 |
| No. 100 | 5 |
| No. 200 | 4 |

• Tractor equipment makes a rough, forbidding land into a first class airport.

As a result of laboratory tests, the Motoyama soils were further classified, using the U. S. Department of Agriculture standards, as follows:

| Classification of Soil | Grain Size in Millimeters |
|---|---|
| Very fine sand | 0.05 to 0.1 |
| Fine sand | 0.1 to 0.3 |
| Medium sand | 0.3 to 0.5 |
| Coarse sand | 0.5 to 1.0 |
| Fine gravel | 1.0 to 2.0 |
| Medium gravel | 2.0 to 10.0 |
| Large gravel | 10.0 to 100 |

All of the "sand" and "gravel" classifications are, of course, volcanic ash. Optimum moisture content for compacting the Motoyama soils ranges from 28%, in very fine material, to 20% in the coarser ash. Coarse soil gives a higher dry weight density, up to 125 lbs. per cu. ft., compared with 95 lbs. in very fine material.

Standard compaction procedure was used insofar as the urgency of the work would permit wherever scrapers hauled fill material. The soil was laid down in lifts six to eight inches thick, and rolled continuously with sheepsfoot rollers ballasted to about 1600 lbs. per linear foot of tread. Salt water was hauled from water points near the sea, and spread in. However, at times the rainfall was too plentiful to suit the engineers and elaborate drainage precautions had to be taken.

### Compacting Volcanic Ash

Some of the buff-colored volcanic ash would not break up under the action of sheepsfoot rollers and tended to retain its lumpy characteristics. Where pockets of this material were found, power shovels excavated it in high, thin slices, breaking it up as much as possible. It was dumped by trucks and spread by bulldozers. The only effective way found thus far of compacting this ash has been to drive a Caterpillar D-8 over it and waggle the steering clutches. The track grousers under an 18-ton tractor would break up the lumps and compact it to some extent. Pavement failures over this kind of subgrade were less noticeable than over some of the finer soils.

Rain falling on the high fills created quite an erosion problem, especially where runoff water drained off down the sides of embankments. Seabees cut drainage ditches along the shoulders, training the water down to a concrete trap, where corrugated metal pipes lead the water down over the sides of the fill. On one of the runways, a timber flume was built by Seabee carpenters for the same purpose.

Iwo Jima has three main levels, and one airfield is located on each of these benches. To take care of the runoff water from rains (normal rainfall at Iwo is 60 inches annually), a drainage canal was excavated from No. 2 airfield down across the level of the Southern Airdrome, leading toward the sea. Only once has the runoff water ever reached the sea. That was in an exceptionally heavy rainstorm. The black volcanic ash is so porous that water soaks down through very readily.

As an example, one of the wells which had been drilled and tested near the field suddenly showed a marked increase in brackishness when salt water was spread on the fill around the well.

Where exceptionally soft subgrade conditions were met—and these were almost always caused by ground steam—the Seabees were forced to put from 12 to 20 inches of four-inch rock under the airfield pavement, extending across both shoulders to join five-foot deep ditches. Any moisture which condenses in this kind of an area promptly drains off through the trenches, which are also filled with four-inch rock. This rock filler came off the primary crusher at a Seabee rock crushing plant near the base of Mt. Suribachi.

It is an interesting fact, and a tribute to American machines and engineering skill, that all the airfield grades were considerably reduced. The best kind of runway the Japanese could build sloped 67/100 of one per cent. Maximum American slopes were 6/10 of one per cent, and much of the topography has been flattened to .085 of one per cent. There is only one grade break on the longest runway.

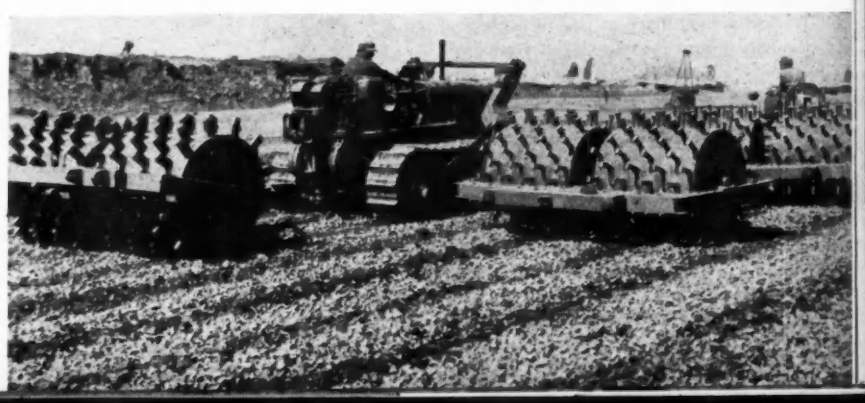
• Buckeye blade on Allis-Chalmers tractor and LeTourneau 'dozer on Caterpillar tractor do some preliminary bulldozing.

### Surfacing Runways

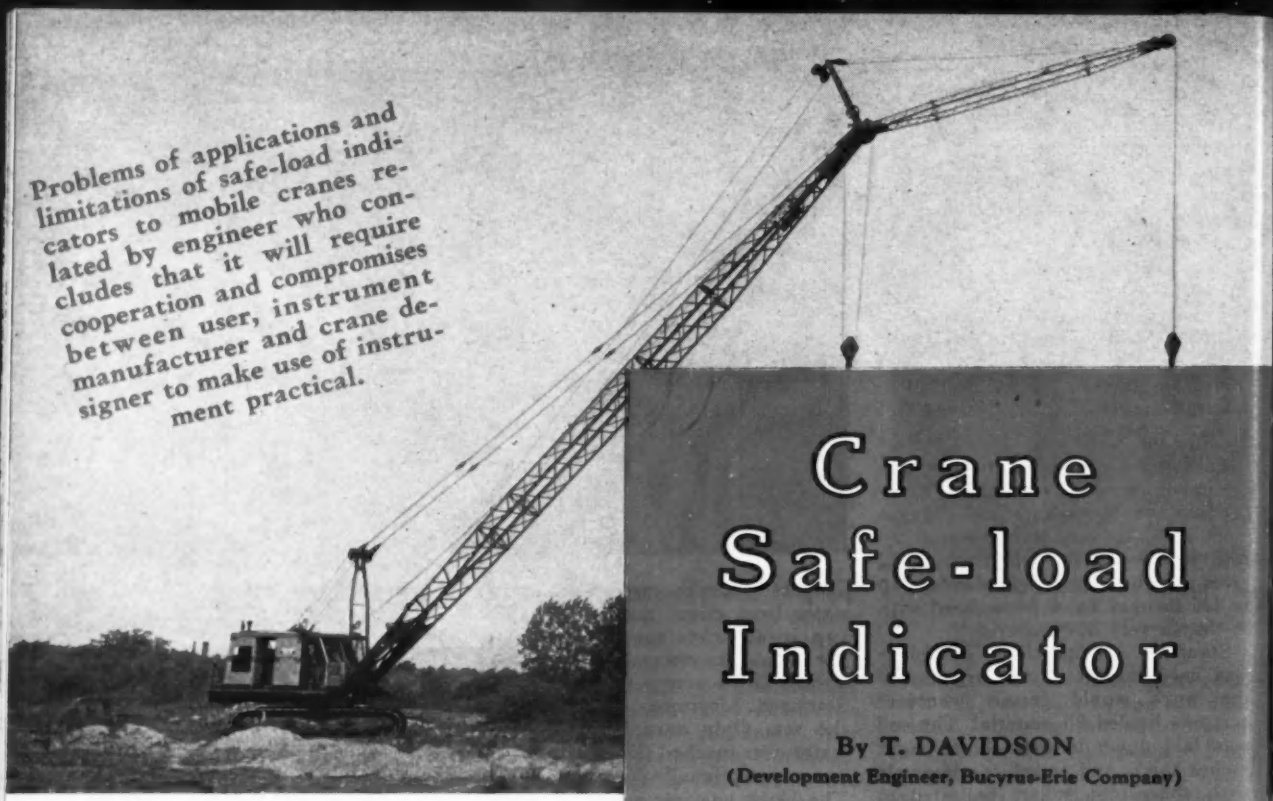
Americans took care of runway surfacing in a manner the Japs never believed possible, though it was under the Jap's noses all the time. Americans used the hard andesitic lava rock found on Iwo Jima to make their runway material, and they did it with only one hot box asphalt plant by substituting penetration macadamized paving on the No. 1 and No. 3 fields.

To place this type of pavement, two sizes of crushed rock were hauled in, spread and rolled. Emulsified asphalt was spread on top of each layer, binding the rock particles together. A blot coat of fine screenings on top of the last layer of asphalt permitted the immediate use of the runway as soon as it was finished. Emulsified asphalt was hauled by

*(Continued on page 582)*



• Sheepsfoot rollers, drawn by Allis-Chalmers HD-7 tractors, consolidate a section of fill.



Problems of applications and limitations of safe-load indicators to mobile cranes related by engineer who concludes that it will require cooperation and compromises between user, instrument manufacturer and crane designer to make use of instrument practical.

# Crane Safe-load Indicator

By T. DAVIDSON
(Development Engineer, Bucyrus-Erie Company)

RECENTLY THERE HAVE been developed and placed on the market equipments which show accurately the relation of a lifted load to a predetermined safe load for any radius at which a crane may be operated. These indicators have been applied advantageously to portal cranes and other large revolving machines in semi-permanent installations.

In principle, an electric strain gage is attached to some structural member of the machine, such as an A-frame back leg, whose stress bears a known relation to the load lifted. Since the ratio of this stress to the lifted load varies with the boom angle, compensating gear is attached to the boom to make the necessary corrections. Readings are shown on a dial meter convenient to the operator, which is calibrated in per cent of the safe limiting load. Designs are based on proven units and are out of the experimental stage.

Load indicators on certain crane work have been required by law in England for several years and units are available there using spring and lever systems in the attachment of the boom suspension tackle to the A-frame. These give a warning signal when the safe load limit is approached.

Many crawler cranes are used in manufacturing plants and industrial applications, where boom length, ballast, etc., are fixed by the job and are not varied. The present safe-load indicators are applicable, readily, to such machines. However, the more or less constant nature of their work makes the need for safe-load in-

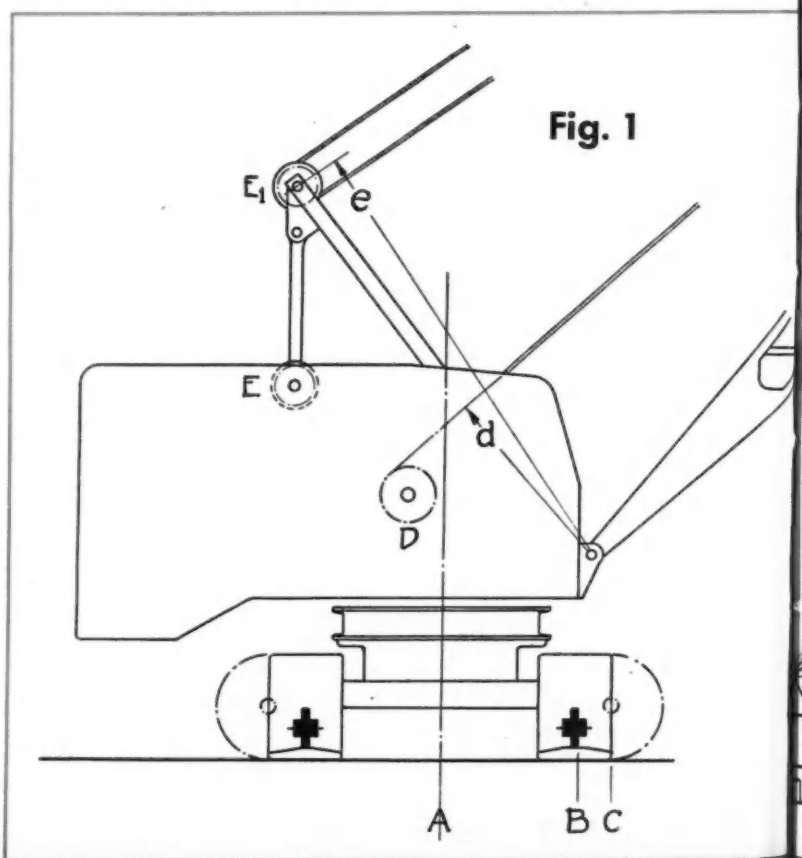



Fig. 1

• Fig. 1—Typical Crawler Mounted Crane: A—Centerline of rotation; B—Tipping axis when working over side; C—Tipping axis when working over end; D—Main hoist drum; E—Head of standard A-frame; E1—Head of high A-frame; d—Arm from boom foot to main hoist line off drum; and e—Arm from boom foot to boom hoist tackle.

dicators of possibly secondary importance.

There is a greater need for such indicators on the mobile machines used in construction work, where loads vary widely, and extreme reaches often are required. Unfortunately, the factors which make these machines particularly suitable to such work are the ones which make the satisfactory application of safe-load indicators particularly difficult. Crawler and wheel-mounted cranes with gasoline or diesel drive have excellent mobility, either under their own power for short moves or by trailer or railway for longer distances. For the sake of this mobility, it is customary to keep the machines as light and compact as possible through minimum ballast, shortest practical boom, low A-frame, etc., and adding extra equipment when necessary for special lifts. It is these possible additions which cause trouble in applying safe-load indicators.

### Assumed Machine

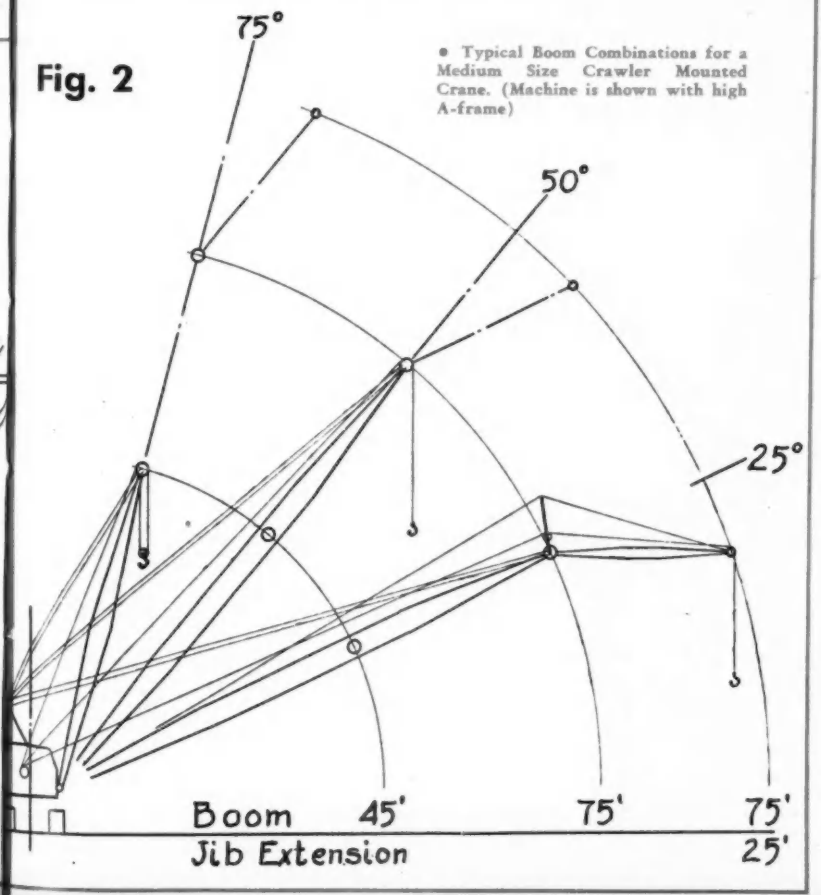
Figure 1 shows the outline of a typical crawler mounted crane and Figure 2 shows three of the various boom combinations which may be used. Since these machines are designed for the much more severe service of excavators, the question of mechanical strength can be ignored (except possibly for maximum loads at minimum radii), and the development of an indicator may be based on the measurement of stability only. The recognized standard for safe loads on crawler mounted cranes is 75% of that load which will just tip the machine.

Since the weight of the boom, the proportions of the crawler, and other physical characteristics of the machine influence the capacity of the machine and the relationship of this capacity to the stress in whatever member is selected for the gage application, a specific machine must be assumed as the basis for an analysis. The data in the above table are representative of a crawler crane which would be rated at about 1½-cu. yds. capacity as an excavator:

**Data on Crawler Crane Rated as 1½-cu. yd. Excavator**

| | |
|---|---|
| Weight of base machine | 70,000 lbs. |
| Center of gravity | 2.75 ft. (behind rotating center) |
| Extra counterweight | 5,000 lbs. |
| Center of gravity of extra counterweight | 10.75 ft. (behind rotating center) |
| Side tipping arm | 4.25 ft. |
| End tipping arm | 5.25 ft. |
| Weight of boom point: | |
| 45 ft. boom | 2,000 lbs. |
| 75 ft. boom | 2,500 lbs. |
| 75 ft. boom and 25 ft. jib | 2,750 lbs. |
| Location of hoist drum, A-frame, etc., as shown in figure 1. | |

Fig. 2




• Typical Boom Combinations for a Medium Size Crawler Mounted Crane. (Machine is shown with high A-frame)

### Factors Affecting Performance

In the following analyses it is assumed that the load indicator is controlled by the tension in the boom suspension tackle. This tension is convenient for calculations and therefore was selected as the actual point of application of the gage because it affects its calibration but not the principles of its performance.

**1. The Effect of Crawler Length**—The crawlers on practically all machines are proportioned so that the length center to center of tumblers is greater than the width to the outer face of the lower track rollers. This is done to prevent excessive ground pressure under the tracks when operating over the end on soft ground. When operating as a crane on hard ground this extra length provides additional stability, and it is common practice to make use of this for occasional heavy lifts when conditions permit. To provide for this contingency two load limits might be shown on the indicator dial, one for use over the side and the other for use over the end. For the assumed machine without extra ballast and with 45 ft. boom at 25°, 50°, and 75° with the horizontal, results would be as shown in Table I on the following page.

**2. The Effect of Number of Parts In Main Hoist Tackle**—The design of the hoisting machinery generally is such that a single part hoisting line is adequate to handle loads limited by stability at medium to long radii, but at shorter radii multiple part hoisting tackles are required. Due to the varied nature of the work on which mobile machines are used, it may not be possible to predict the number of parts which will be used at the time the safe-load indicator is installed. Changes in the number of parts used in the hoisting tackle affect the load in the line from the hoisting drum and since this line is an appreciable distance from the pivot point of the boom it has an appreciable effect on the load in the boom suspension tackle which controls the indicator.

In Table I it was assumed that a three part tackle was used with the

**TABLE I**

| Boom Angle | Load Radius from Center | Safe Load over Side | Safe Load over End Based on Stability | Safe Load over End Based on 16% Increased Tackle Pull | |
|---|---|---|---|---|---|
| 25° | 46 ft. | 7,250 lbs. | 8,750 lbs. | 8,750 lbs. | 100% |
| 50° | 34 ft. | 10,750 lbs. | 13,000 lbs. | 12,850 lbs. | 99% |
| 75° | 16½ ft. | 27,900 lbs. | 35,000 lbs. | 32,600 lbs. | 93% |

**TABLE II**

| Main Hoist Tackle | Safe Load Based on Stability | Safe Load Based on Constant Boom Suspension Tackle Pull | |
|---|---|---|---|
| | 45 ft. Boom at 25° | | |
| 1 Part | 7,250 lbs. | 7,250 lbs. | 100% |
| 2 " | " | 6,800 lbs. | 94% |
| 3 " | " | 6,650 lbs. | 92% |
| 4 " | " | 6,600 lbs. | 91% |
| | 45 ft. Boom at 50° | | |
| 1 Part | 10,750 lbs. | 12,100 lbs. | 113% |
| 2 " | " | 10,750 lbs. | 100% |
| 3 " | " | 10,350 lbs. | 97% |
| 4 " | " | 10,150 lbs. | 95% |
| | 45 ft. Boom at 75° | | |
| 2 Part | 27,900 lbs. | 31,400 lbs. | 113% |
| 3 " | " | 27,900 lbs. | 100% |
| 4 " | " | 27,100 lbs. | 97% |
| 6 " | " | 25,200 lbs. | 90% |

**TABLE III**

| Angle of Boom | Length of Boom | Safe Load Based on Stability | Safe Load Based on Constant Boom Suspension Tackle Pull | |
|---|---|---|---|---|
| 25° | 45 ft. | 7,250 lbs. | 7,250 lbs. | 100% |
| | 75 ft. | 3,450 lbs. | 3,050 lbs. | 89% |
| | 75 ft. + 25 ft. | 1,850 lbs. | 1,200 lbs. | 65% |
| 50° | 45 ft. | 10,750 lbs. | 10,750 lbs. | 100% |
| | 75 ft. | 5,650 lbs. | 4,550 lbs. | 81% |
| | 75 ft. + 25 ft. | 3,050 lbs. | 1,680 lbs. | 55% |
| 75° | 45 ft. | 27,900 lbs. | 27,900 lbs. | 100% |
| | 75 ft. | 16,500 lbs. | 13,850 lbs. | 84% |
| | 75 ft. + 25 ft. | 8,150 lbs. | 5,700 lbs. | 71% |

**TABLE IV**

| Angle of Boom | Safe Load Based on Stability | Indicated Safe Load if High A-Frame is Used | |
|---|---|---|---|
| 25° | 7,250 lbs. | 13,800 lbs. | 190% |
| 50° | 10,750 lbs. | 17,300 lbs. | 160% |
| 75° | 27,900 lbs. | 36,600 lbs. | 130% |

**TABLE V**

| Angle of Boom | Safe Load Based on Stability: Standard Counterweight | Safe Load Based on Stability: 5,000 lbs. Extra Counterweight |
|---|---|---|
| 25° | 7,250 lbs. | 8,550 lbs. |
| 50° | 10,750 lbs. | 12,600 lbs. |
| 75° | 27,900 lbs. | 32,400 lbs. |

boom at 75°. This is about the minimum number which should be used for such loads; four or even six parts are more probable. Table II shows the effect changes in the number of parts will have on the indicated safe load when a 45-ft. boom is used over the side. It is assumed that the indicator is set to show the proper load with a single part tackle when the boom is at 25°, two part tackle at 50°, and three part tackle at 75°.

If the indicator can be set up for a constant number of parts in the hoist tackle, it will be satisfactory, but conditions of operation may make this impractical. If the indicator is adjusted for different numbers of parts, depending on the boom angle, there is the possibility of appreciable overloading if too few parts are used at angles just above the transition points.

**3. The Effect of Boom Length**—These machines are designed so that the boom length easily can be varied from one job to the next, or for different sections of the same job. Figure 2 shows three boom lengths which are by no means extremes.

Table III lists the safe loads based on stability for the various booms shown in Figure 2, and also the indicated safe loads based on constant boom suspension tackle pulls for each angle, using the tackle pull for a 45 ft. boom as a base. The table is based on single part hoist tackles for all booms at 25° and 50°, and three part tackles at 75°. A high A-frame was used throughout as it generally is required for a 75-ft. boom on a machine of this size (see item 4).

**4. The Effect of A-Frame Height**—In order to keep down the overhead clearance of this type machine to clear underpasses, etc., the A-frame generally is kept flush with the cab roof and therefore is quite low. However, when long booms are used it is customary to provide some sort of extension to the A-frame (such as indicated by the high A-frames in figures 1 and 2) to avoid the necessity of making these long booms heavy enough to carry the high compression which would be developed with the standard A-frame.

If a safe-load indicator actuated by the boom suspension load were calibrated for a 45-ft. boom with standard A-frame and the boom then were used with the high A-frame, the safe-load indicator would allow overloads as shown in Table IV.

**5. The Effect of Counterweight Changes**—Minimum weight generally is desirable to simplify moving the machine from job to job, so that some

*(Continued on page 586)*

"I wouldn't worry too much about it — if it hasn't gone off by now, it's probably a dud!"

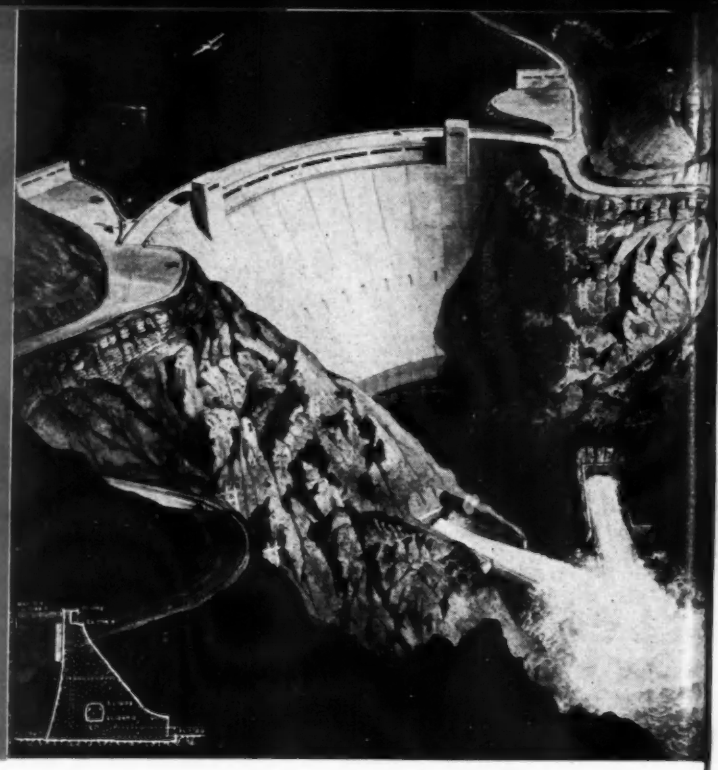
"He wants to know do we mind, can he sleep on one of our rollers tonight?"

"Why Lootenant, sir, ain't you heard? Th' non-fraternization ban was lifted long ago."

"Yeah, you're right — he is an interesting worker!"

"I don't believe it! I can't understand it! This is th' goofiest bunch I ever worked with!"

# BRIDGE CANYON DAM



**Bureau of Reclamation's plans for structure that will outrank Boulder Dam in height and mass call for 4,360,000 cu. yds. of open cut excavation for the dam, 3,000,000 cu. yds. of excavation for preliminary construction of highway and railroad to the dam site, and aggregate for 6,000,000 cu. yds. of concrete.**

PLANS for the proposed Bridge Canyon Dam, now under study in the office of the Chief Engineer of the Bureau of Reclamation in Denver, Colorado, call for a structure that will outrank Boulder Dam both in height and in mass. It is planned as a part of the Bureau of Reclamation's program for complete conservation and utilization of the Colorado River.

The dam will be located on the Colorado River at the head of Lake Mead 118 miles upstream from Boulder Dam, and will store water and provide head for generating hydroelectric power. Bridge Canyon Dam will contain the power plant, transformer deck, and outlet works entirely within the dam structure for greater economy, avoidance of spray interference with the electrical mechanism, and security from bombing.

Comparison of some of the dimensions and features of Bridge Canyon Dam with those of Boulder Dam, made in the following table, will give an idea of the enormity of this project:

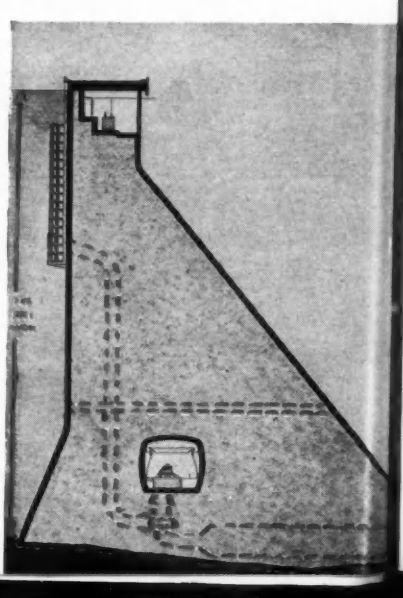
| | Bridge Canyon | Boulder |
|---|---|---|
| Maximum height (ft.) | 736 | 726 |
| Hgt. above river surf. (ft.) | 659 | 576 |
| Crest length (ft.) | 1,950 | 1,244 |
| Mass concrete (c.y.) | 5,650,000 | 3,250,000 |
| Reservoir capacity (a-f.) | 3,700,000 | 31,141,000 |
| Power gen. capacity (kw.) | 750,000 | 1,317,500 |

The Bridge Canyon Dam site is in the Granite Gorge section of the Colorado which is similiar in topography, geology, and scenic grandeur to the Grand Canyon 80 miles upstream. The location chosen takes advantage of a narrow point in the canyon, where rock formations have a greater resistance to the erosive forces of nature than elsewhere. The sheer walls of the lower part of the canyon, rising several hundred feet above the floor of the gorge, are surmounted by more than a thousand feet of precipitous cliffs. While this section is one of the most scenic reaches of the Colorado, it has seldom been visited due to its relative inaccessibility.

**• Under current study by the Bureau of Reclamation is Bridge Canyon Dam, felt necessary for full development of the Colorado River's power. This drawing shows the dam and power plant which will be located 120 miles upstream from Boulder Dam.**

Geological conditions at the site are favorable for construction of a high dam which will rest on granite gneiss overlain by hard, durable Tapeats sandstone. Higher up the steep sides of the canyon, but not of concern with respect to the dam foundation and abutments, are the formations of Bright Angel shale, Muav dolomite, and Red Wall limestone at the canyon rim.

The rock formations are structurally strong and without important defects, assuring adequate support and



**• Cross section sketch of dam as now designed with its height of 740 feet above bedrock, a base thickness of almost 680 feet, and a crest length of 1,950 feet giving it a magnitude reflected in the comparison to the Daniels & Fisher Tower shown alongside.**

**The tunnel-like opening in the outer side of the dam section will contain the power plant and transformer deck, both of them extending across the full width of the canyon and a short distance into each abutment.**

**• Map of Central Arizona Project showing general relation of alternate plans for taking water from one of the reservoirs to the Salt and Gila Rivers valleys.**

**Under the Bridge Canyon Plan an 80-mile tunnel from the dam would pierce the high land to Big Sandy River from which a 270-mile canal would convey water to the Salt River.**

**Marble Gorge Plan provides for diversion of water at Marble Gorge Dam through a 139-mile tunnel to Verde River and then to the Salt River.**

**Parker Pumping plant would lift water 1,040 feet from Parker Dam reservoir to a canal extending through an intermediate reservoir to Salt River.**

restraint of the structure. Sound rock is exposed over most of the area, and stripping operations therefore will be confined chiefly to excavation for keying the dam into the rock and to performing the necessary "dental" work on the abutments. Overburden in the river channel, measuring about 50 feet in depth, is composed of silt, sand, and gravel with some large boulders near bedrock.

The difficulty of access to the dam site was a major problem in conducting the investigations. Boats from Pierce's Ferry on Lake Mead were used for reconnaissance of the dam site when the water level was high enough to permit entrance to the Granite Gorge. However, during the detailed investigations, access was chiefly by road from Peach Springs, Arizona, to the head of Hindu Canyon and then down this tributary canyon 12 miles by pack trail to the site. Supplies and equipment were packed in by horses and mules over this trail to the engineers' camp in the canyon.

Providing facilities for the transportation of construction materials and equipment from the railhead at Peach Springs to the dam site will constitute the most important preliminary construction problem. Construction of the 24.5-mile highway from Peach Springs to the site will involve heavy rock excavation. In addition to the highway, it is probable that construction of a railroad 14.5 miles in length from Peach Springs to the canyon rim, facilities for transferring materials to trucks, and a heavy duty highway from the transfer yard to the dam site may be required. Preliminary estimates show that the highway construction from Peach Springs to the

*(Continued on page 590)*

**• The proposed dam, circled on this photo of the dam site in this rugged section of the Colorado River, will contain more than 5,000,000 cu. yds. of concrete. The red lines indicate the outline of a part of the reservoir.**

# *Equipment*
# you ought to KNOW ABOUT

**For further details about the equipment on these pages please write to the manufacturer, mentioning Excavating Engineer.**

## Safety Splice

**Manufacturer:** American Chain & Cable Company, Inc., Bridgeport, Conn.

**Claims:** A new wire splicing method that renders hand-tuck splicing obsolete is claimed possible with the Acco-Loc Safety Splice. Neatness and compactness with flexibility to the terminal develops 100% of the rope's

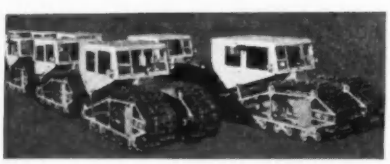
strength with no distortion or unequalization of stresses in the strands. Elimination of loose ends and easy visual inspection also are claimed for the new product.

## Snow Cruisers

**Manufacturer:** Iron Fireman Mfg. Co., Portland, Oregon.

**Claims:** After perfecting the design of an experimental Forest Service tractor and making it adaptable for volume production, the manufacturer states it has recently completed an Army Ordnance contract for construction of the first 40 "Snow Cruisers" to be used by the Army Air Corps for search and rescue work in snow-bound areas.

The Iron Fireman Mfg. Co. forsees new strides for postwar freighting of



supplies and personnel, particularly to mining and logging camps and to trappers in the world's snow countries, as well as for use in the maintenance power transmission lines over snowy mountainous areas.

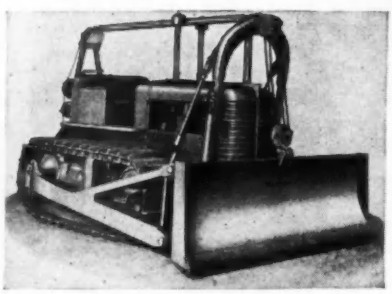
The light weight, wide-treaded tractor is capable of transporting 4000 pounds in deep snow and up grades of 35°. Built of four component parts—two tracks, power section and cab—the tractor can be readily dismantled for transportation by a plane. It travels 18 miles an hour under average conditions and two miles an hour under difficult snow conditions and steep grades. Where the snow is deep, an especially wide track system prevents sinking beyond operating level.

Plans to manufacture the Snow Cruisers on a commercial basis after the war are being made, the manufacturer announced.

## Cable Controlled Bulldozer

**Manufacturer:** The Baker Mfg. Co., Springfield, Ill.

**Claims:** With reinforced tubular arch, box welded moldboard, five-position side arms which permit tilting of blade up to 10 inches on the bulldozer and 12 inches on the Gradebuilder, and 42 inch blade lift for the bulldozer are features claimed for



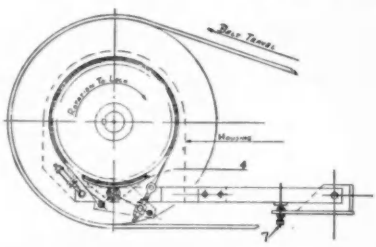
these new cable operated Gradebuilders and bulldozers made exclusively for Allis-Chalmers tractors.

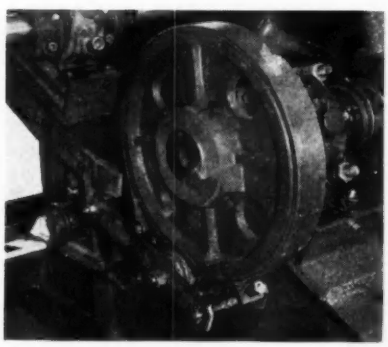
Included is a rear power control unit with "air-conditioned" cone type clutches and three-inch band brakes. All clutch and brake adjustments are made from the rear. It was stated that the curved contour of the drum barrel at the anchor end assists the rope to wind closely at the start of winding.

## Band Back Stop

**Manufacturer:** Barber-Greene Company, Aurora, Ill.

**Claims:** A shoe acting directly on the brake drum is one of the unique features claimed for a new, improved differential band-type back stop. The new stop, available in 12", 18" and 24" diameter drum size, is said to be the most simple, trouble-free back stop yet devised for preventing belt conveyors or bucket elevators from running backwards due to this belt or bucket load when, for any reason, the





power is shut off. According to the manufacturer the back stops provide more frictional area, require less tension in the band, remove danger of bending the shaft, and require a simpler anchor than any other brake of equal size.

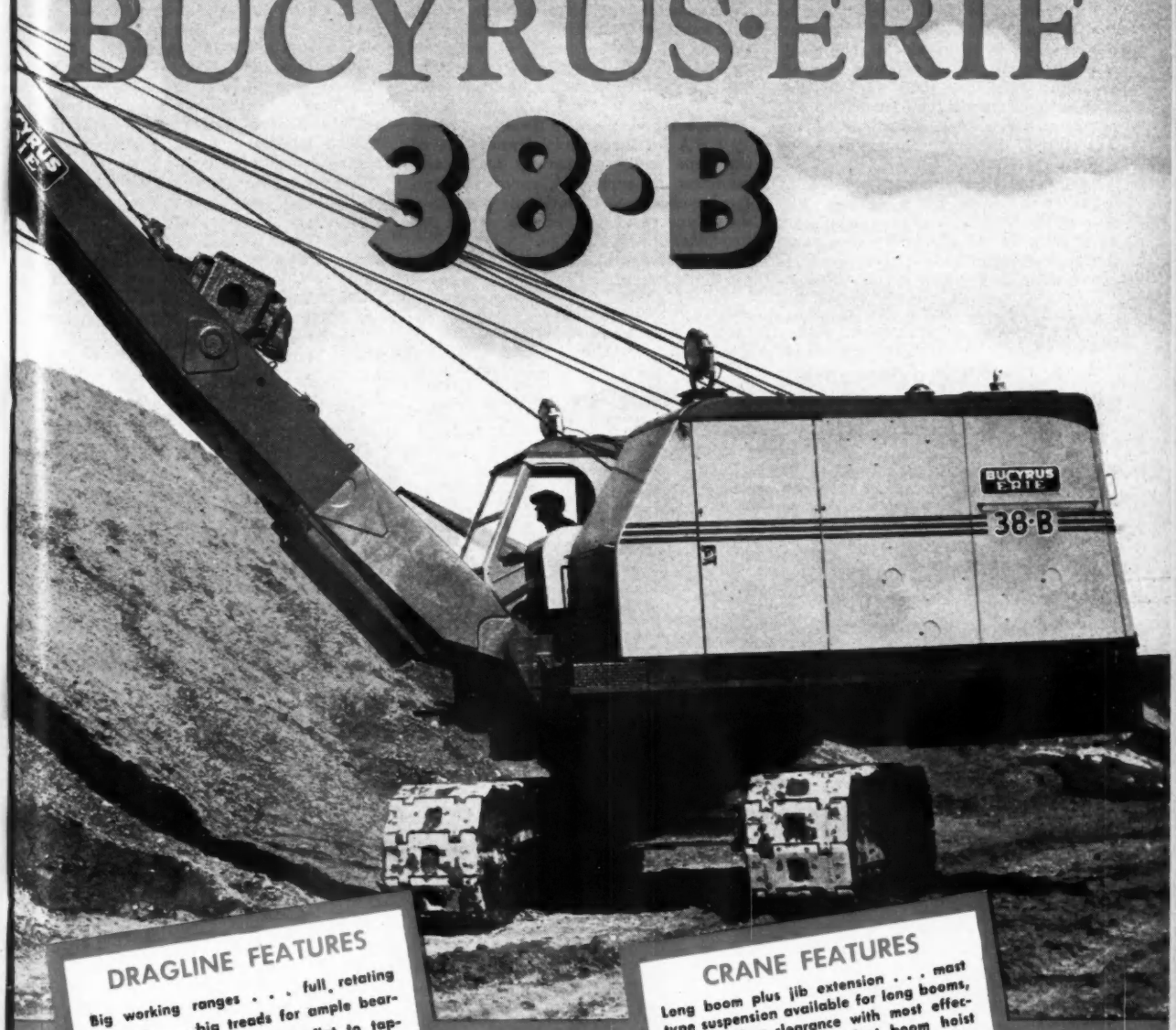
## Electrode Holder

**Manufacturer:** Martin Wells, 5886 Compton Ave., Los Angeles 1, Calif.

**Claims:** Slippage prevention, quick and easy rod-changing, and positive grip, are vouched by the manufacturer for this Stubby model electrode hold-

er. Has all-plastic four-cornered collar, takes 300 amp., holds small rods upright. The manufacturer also asserts the "mitt-grip" collar keeps holder from rolling and remains cooler than the cap.

# The 1½ Yard BUCYRUS-ERIE 38-B




## DRAGLINE FEATURES

Big working ranges . . . full, rotating fairlead . . . big treads for ample bearing area (convertible from flat to tapered ends in field) . . . fully responsive control . . . over-size brakes.

## CRANE FEATURES

Long boom plus jib extension . . . mast type suspension available for long booms, combines low clearance with most effective support . . . independent boom hoist with full, accurate power control of raising and lowering . . . high stability . . . independent 2-speed propel available.

# *Shots* from the FIRING LINE

## Additional Funds Needed For Local Public Works

Applications by local governments to the Federal Works Agency for loans to complete plans of needed public projects prove the value of this form of assistance and the need for the appropriation of additional funds for this purpose, H. A. Dick, president of the Associated General Contractors of America, declared.

Under the limited program of $17,500,000 provided by Congress last spring, the Federal Works Agency had, as of August 31, approved loans totaling $4,260,928 and had applications under review in the amount of $10,909,990, he said, and for 14 of the more populous States applications pending were more than sufficient to exhaust their allocations. This means, he added, that subsequent applications from those states, where the early starting of projects is undoubtedly most urgent, will have to be held in abeyance for lack of funds.

Projects which have been approved by FWA for loans and advances are of the type badly needed by local communities, he continued, such as hospitals, schools, recreational facilities, water and sewerage systems, street improvements and the like.

"These loans and advances are made available to state and local governments," Dick explained, "from the appropriation made by Congress under the authority of Title V of the War Mobilization and Reconversion Act of 1944, to aid States and their political subdivisions in the advance planning of postwar projects. Title V specifically provides that the making of these loans or advances shall not in any way commit the Federal Government to assist in the construction of public works planned with these funds."

The appropriation of additional funds to aid state and local governments in completion of plans for needed public projects was among the recommendations which President Truman has made to Congress. Other recommendations include the starting of the postwar Federal-aid highway program, enactment of the Federal-aid airport program, and the releasing of funds for war-deferred public projects of various kinds.

STATUS OF APPLICATIONS FOR ADVANCES FOR PLAN PREPARATION THROUGH AUGUST 31, 1945, BY STATES

| State | Approved | Under Review | Total Available Under Appropriation |
|---|---|---|---|
| United States | $4,260,928 | $10,909,990 | $15,803,181 |
| Alabama | 98,196 | 743,550 | 228,225 |
| Arizona | 6,100 | 30,360 | 84,875 |
| Arkansas | 62,648 | 40,539 | 222,135 |
| California | 70,795 | 115,558 | 787,097 |
| Colorado | 21,100 | 47,933 | 128,025 |
| Connecticut | 63,350 | 157,500 | 194,788 |
| Delaware | — | — | 84,875 |
| Florida | 161,766 | 435,172 | 216,329 |
| Georgia | 92,931 | 16,559 | 356,119 |
| Idaho | — | — | 84,875 |
| Illinois | 121,096 | 2,299,932 | 900,150 |
| Indiana | 37,493 | 681,554 | 390,646 |
| Iowa | 44,917 | 43,007 | 289,356 |
| Kansas | 74,263 | 26,921 | 205,330 |
| Kentucky | 54,032 | 60,383 | 324,341 |
| Louisiana | 157,759 | 173,570 | 269,495 |
| Maine | 37,850 | 47,260 | 96,554 |
| Maryland | 64,880 | 89,230 | 207,621 |
| Massachusetts | 101,045 | 210,644 | 492,088 |
| Michigan | 259,862 | 541,143 | 599,031 |
| Minnesota | 52,765 | 17,877 | 318,230 |
| Mississippi | 79,140 | 43,594 | 248,870 |
| Missouri | 268,374 | 720,580 | 431,437 |
| Montana | 27,754 | 108,940 | 84,875 |
| Nebraska | 48,965 | 43,246 | 150,025 |
| Nevada | — | 35,000 | 84,875 |
| New Hampshire | — | 37,500 | 84,875 |
| New Jersey | 122,200 | 1,696,400 | 474,214 |
| New Mexico | 8,500 | 2,000 | 84,875 |
| New York | 859,060 | 2,000 | 1,536,305 |
| North Carolina | — | — | 407,145 |
| North Dakota | 14,300 | 10,000 | 84,875 |
| Ohio | 131,615 | 683,970 | 787,402 |
| Oklahoma | 213,876 | 156,845 | 266,287 |
| Oregon | — | 43,530 | 124,206 |
| Pennsylvania | 230,015 | 307,395 | 1,128,396 |
| Rhode Island | — | 10,000 | 84,875 |
| South Carolina | 28,270 | 1,500 | 216,482 |
| South Dakota | 1,600 | 3,450 | 84,875 |
| Tennessee | 3,575 | 18,500 | 332,286 |
| Texas | 295,487 | 126,172 | 731,181 |
| Utah | — | 31,886 | 84,875 |
| Vermont | 19,500 | 3,000 | 84,875 |
| Virginia | 133,525 | 1,235,108 | 305,245 |
| Washington | 20,000 | 65,000 | 197,844 |
| West Virginia | 116,301 | 217,007 | 216,788 |
| Wisconsin | 2,000 | — | 357,646 |
| Wyoming | — | — | 84,875 |
| District of Columbia | 54,000 | 31,000 | 84,875 |
| Alaska | — | 13,000 | 84,875 |
| Hawaii | — | — | 84,875 |
| Puerto Rico | — | — | 213,121 |

## Kansas Highway Contracts Ready for Award

Kansas State Highway Director D. J. Fair announced that between $26,000,000 and $30,000,000 of highway construction contracts would be awarded by Kansas before the end of the current calendar year.

"Unless there is some unexpected hitch in present plans," he added, "most of the construction will be under way by the end of this year."

## Rae and Foster Named to Montana Commission

W. E. Rae of Havre was appointed by Gov. Sam C. Ford to represent district No. 3 on the Montana State Highway Commission, succeeding A. E. Kathan of Brady, resigned. At the same time Governor Ford reappointed J. E. Foster of Harlowton to represent district No. 2 on the commission.

## Future Army Contracts on Competitive Basis

Effective immediately greater reliance will be placed upon competitive prices in the awarding of Army contracts, the War Department has announced. This is a departure from the wartime practice of letting contracts on a strictly negotiated basis. The change has been made possible because of the tremendous drop in Army procurement, the relaxation of delivery schedules and the consequent increase in competition for the business.

Where there is competition for War Department procurement, the chief of the technical service involved will ad-

*(Continued on page 566)*

# DEADLINES!

Socony-Vacuum lubrication service *saves more time, more ways, in more departments* because it's flexible, all-inclusive!

Our complete line of quality lubricants means exactly the right oil or grease for every application . . . eliminates the need for special orders . . . means less chance of a single machine slowing down or stopping the work of your entire plant . . . more productive hours for your equipment.

Moreover, your Socony-Vacuum Representative is an expert in planning regular on-the-job deliveries to speed field operations, minimize inventory problems! He'll also supply tested maintenance schedules . . . help your men adapt them to your specific needs . . . instruct "green" help on where, when and how to lubricate all your machines. If you require engineering aid, this is another service he can bring you.

Why be satisfied with fuels and lubricants alone? Save time with Socony-Vacuum's *complete* Lubrication Service!

**"ON YOUR STAFF—BUT NOT ON YOUR PAYROLL"—**

**Your Socony-Vacuum Representative**

## CORRECT LUBRICATION FOR EVERY PART OF EVERY MACHINE YOU OPERATE . . .

**PLUS** ① ENGINEERING HELP on time-losing operating problems; ② TESTED MAINTENANCE SCHEDULES that minimize service man-hours—keep equipment on the job; ③ PROMPT, DEPENDABLE DELIVERY—a reliable, on-the-job service that eliminates inventory problems for you!

**TUNE IN "INFORMATION PLEASE"—MONDAY EVENINGS, 9:30 E.W.T.—NBC**

## Shots from the Firing Line

*(Continued from page 562)*

vertise and solicit quotations. All requests submitted to contractors will state that while the award of a particular contract will normally be made to the lowest qualified bidder, the War Department reserves the right to award the contract as the result of negotiation and to reject any or all bids.

If the price is fair and reasonable and the bids received indicate the effect of competition, the award will be made to the low bidder and no detailed analysis of estimated cost will be needed. No further negotiation will be necessary under such conditions. However, if no real competition is reflected in the bids, if an insufficient number of contractors submit bids, or if prices bid are excessive as compared with earlier prices, an analysis will be necessary and negotiation will continue. This practice will also be followed if Army procurement requirements absorb a substantial portion of the capacity of an industry or if requirements are placed with a sole source, as in research and development contracts. If bid prices indicate that the contractors are deliberately pricing themselves out of government business in order to handle civilian business, the same procedure will be followed.

## Hockensmith New Director of WPB Construction Bureau

Appointment of George L. Hockensmith as director of the War Production Board's Construction Bureau to succeed John L. Haynes was announced by Harold Boeschenstein, WPB's operations vice chairman.

Mr. Hockensmith has served as deputy director of the Construction Bureau since July, 1945 and was chair-


SEVEN REASONS

WHY REXALOY ELECTRODES WILL "FILL THE BILL" FOR YOU

REXALOY Electrodes have the following properties and characteristics:

1. Made in sizes 1/8", 5/32", 3/16", and 1/4".
2. Operate equally well on either A. C. or D. C. machines, in all positions.
3. Are not affected by moisture to the extent that they are not usable, but, after drying, will perform as formerly.
4. Deposits can be forged and heat treated.
5. The coating is metallic, and becomes a part of the overlay, which means freedom from slag or scale.
6. Deposits have a Brinell hardness rating of 300 to 687, depending on the base metal on which deposited.
7. Designed on the principle that toughness is a desirable property, REXALOY electrodes will not become brittle after application, but will retain, within a few points, their original hardness throughout their use.

THE SIGHT FEED GENERATOR COMPANY
RICHMOND, INDIANA

"SIGHT FEED" ACETYLENE GENERATORS • "REXARC" A.C. WELDERS

HAYWARD BUCKETS

WON'T QUIT OR CAUSE TIME OUT

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.

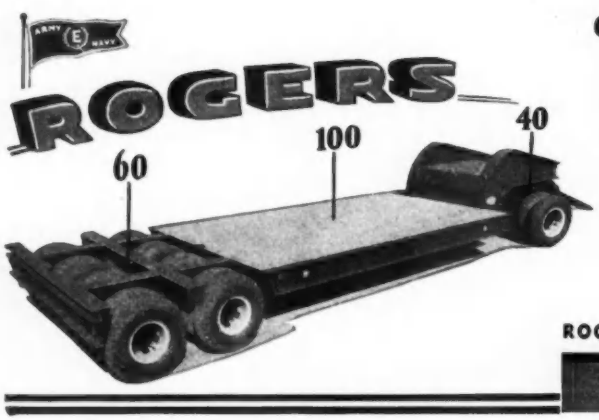
A Time-Saving ACCESSORY

Beco BLOCKS & LININGS

Beco Blocks and Linings take the heavy loads at the increased speeds demanded of modern excavating equipment. These Beco products are durable and tough — that's why replacements and adjustments are less frequent.

T34A

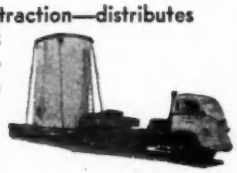
BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN




Contribute to Unusual Performance

ROGERS TRAILERS are so designed as to carry 60% of the load on the rear unit and 40% on the tractor.

This provides the necessary traction—distributes the load properly over all tires —and greatly improves the haulability and brakeability of both tractor and trailer.

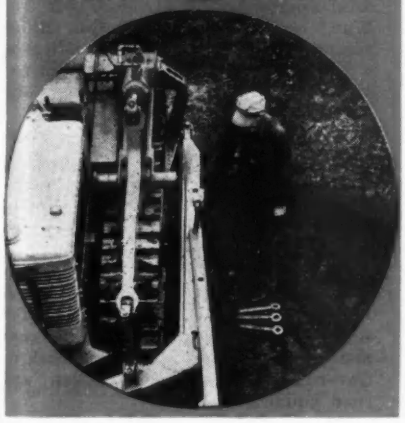


ROGERS BROTHERS CORP. ALBION, PENNA.

EXPERIENCE builds 'em PERFORMANCE sells 'em

# ANGLING AND TILTING

## that the OPERATOR Will Use!



"Sure . . . a blade angling and tilting feature can be a big help on plenty of jobs . . . but I'll be darned if I'll bother to angle or tilt if it takes a half hour to do it! I want to move dirt!" The Speaker? Almost any blade equipment operator. It's no problem to get your operators to use the effective angling and tilting features of Bucyrus-Erie Bullgraders, because they're both so easy to do — fast. Without tools, the operator angles the blade by pulling the landside pins, adjusting the blade to the correct angle, and replacing the pins. To tilt, he uses a landside pin to hammer out the wedges that hold the blade in position, shifts the blade to the tilt he wants, hammers the wedges back in place. Neither angling nor tilting takes more than a couple of minutes!

Both you and your operators will like the many other features of the Bucyrus-Erie Bullgrader, too: its easy handling through smooth hydraulic control and balanced-to-the-tractor design, its powerful digging down pressure, its complete visibility, its ability to handle so many jobs efficiently. Ask your International TracTracTor Distributor for complete details.

12T45C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

SEE YOUR INTERNATIONAL TRACTRACTOR DISTRIBUTOR

man of the Construction Requirements Committee prior to that date. Before entering Government service in December, 1941, he was engaged in foundation construction work in various parts of the country. He holds a degree in engineering from the University of Maryland. His home is in Washington, D. C.

Mr. Haynes, also of Washington, D. C., served as director of the Construction Bureau from December, 1944 to the present time. He is expected to take up an assignment at the Department of Commerce in connection with the establishment of the proposed construction division of the Bureau of Foreign and Domestic Commerce. Prior to going to WPB in December 1941, he was with the Securities and Exchange Commission, the Charles H. Tompkins Company, Washington, D. C., the U. S. Engineers Office, and the N. P. Severn Company, Chicago.

## Quick Work of Contractors Helped Develop Bomb

Expeditious completion of construction by contractors of buildings and facilities at Oak Ridge, Tenn., Pasco, Wash., and Alamogordo, N. M., aided greatly in completion of scientific experiments leading to development of the atomic bomb, H. E. Foreman, managing director of the Associated General Contractors, reported today.

On account of their isolated locations, each project required construction of plants and facilities and housing and community facilities for thousands of workers, he said. At Oak Ridge, it involved the building of a complete city for a population of 78,000, requiring about 9,600 housing units, 5,000 trailer units and 90 dormitories, together with a shopping district and other facilities. The first construction was started at Oak Ridge on Jan. 25, 1942.

General contractors on this project were Stone & Webster Engineering Corp., New York City; Ford, Bacon & Davis, New York City, and John A. Jones Construction Co. Inc., Charlotte, N. C.

At Pasco, the principal construction work was handled by Morrison-Knudson Co., Inc., Boise, Idaho. At this project, approximately 2,000 housing units were required for workers, in addition to plant structures.

Dozens of additional contractors, general and special, handled various parts of these projects. All information about the Alamogordo project is still being withheld by the War Department as a military secret.

Total expenditures involved to date in the bomb developments at three projects, including construction costs, total approximately $1,665,000,000, the War Department reports. Oak Ridge accounts for the largest expenditures, a total of about $1,106,000,000; Pasco, about $382,000,000; Alamogordo and miscellaneous, $180,000,000.

## Schedule AED Distributors' Meetings for Fall Months

The Executive Committee of the Associated Equipment Distributors (A.E.D.) held a three-day meeting at the Edgewater Beach Hotel, Chicago, September 28-29-30 to lay plans for the Annual Membership Meeting in January 1946, and to discuss disposal of Government-owned construction and road building machinery.

During October and November regional conferences will be held by the directors of the 15 A.E.D. geographical regions throughout the United States and Canada to implement A.E.D.'s program on behalf of the industry in relation to post-war activities and problems.

## Keenan to Spearhead Construction Program

Moving swiftly to enable industry to carry out its program of $4,500,000,000 for new plant, equipment and alterations in the shortest possible time, J. A. Krug, Chairman of the War Production Board, appointed Joseph D. Keenan, the board's vice chairman for labor production, to spearhead the gigantic construction program.

In his new position as special assistant to the Chairman in charge of construction, Keenan will speed up construction activities necessary for reconversion and will represent WPB


HOW A B-G BUCKET LOADER *Cuts Costs* FOR THE CONTRACTOR

● Any contractor knows that the continuous operation of a bucket loader yields a higher yardage of bulk material at less cost than any other method of loading. The cost of operating a Barber-Greene Bucket Loader is lowest of all. Here are a few of the long-life and time-saving features that keep expenses at rock bottom:

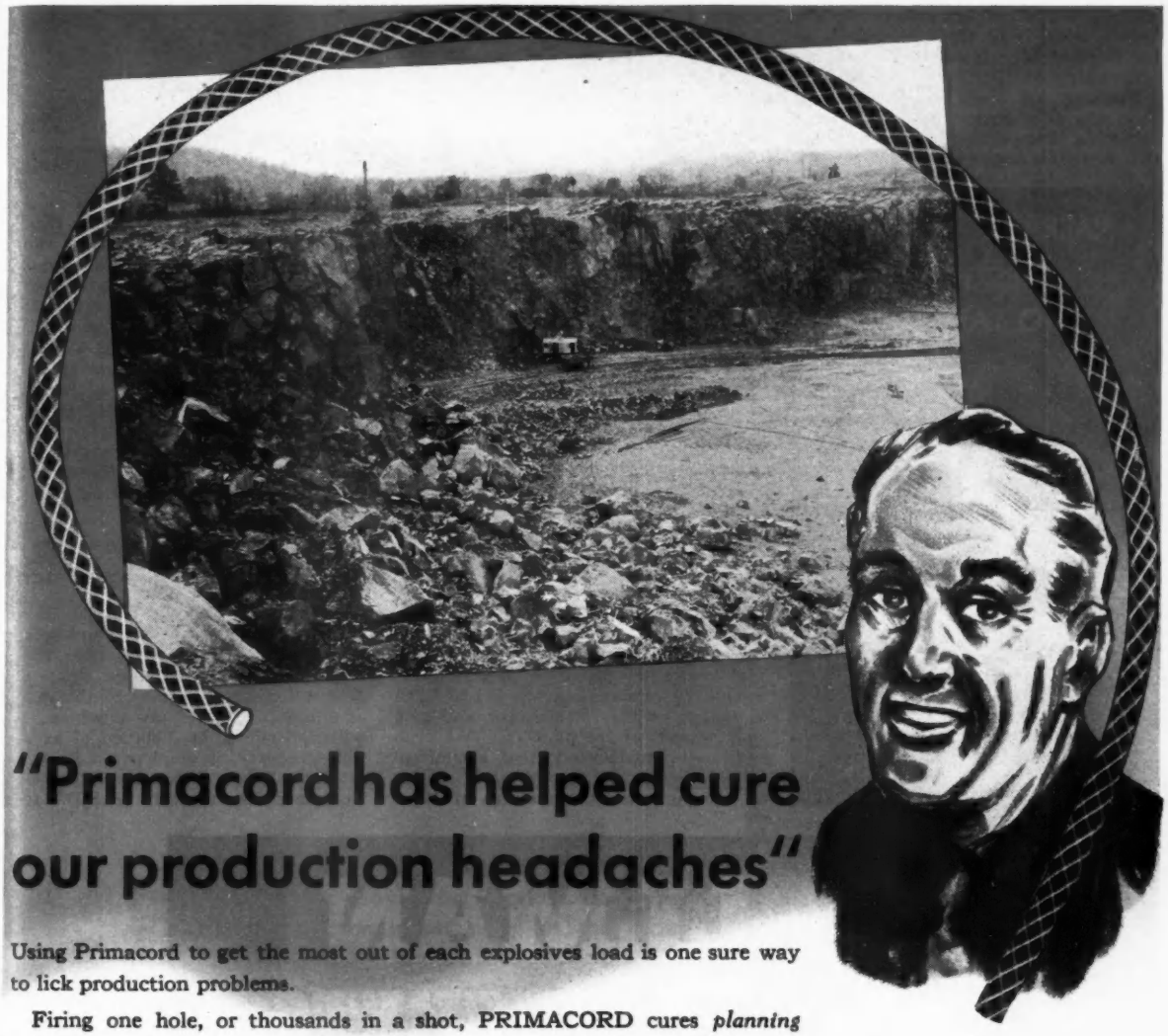
1. **Strain and damage to boom frame are prevented because the thrust of loading is transmitted directly to the crawlers through push arms.**
2. **Clean pick-up is assured by the automatic follow-up scraper.**
3. **Wear of working parts is reduced with use of a double transmission that permits 12 crowding speeds.**
4. **The Automatic Overload Release prevents breakage of operating units.**
5. **Points of greatest wear on the buckets are faced with an abrasion-resisting weld.**

For complete details see your B-G representative. Barber-Greene Company, Aurora, Illinois.

45-02A

Barber B-G Greene

*Constant Flow Equipment*



# "Primacord has helped cure our production headaches"

Using Primacord to get the most out of each explosives load is one sure way to lick production problems.

Firing one hole, or thousands in a shot, PRIMACORD cures *planning* problems — allows for more drilling between moves . . . more effective use of men and equipment.

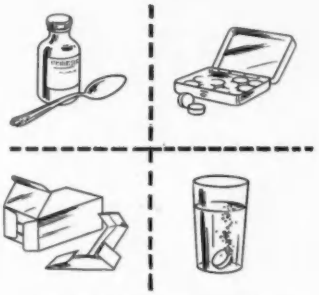
Getting the right power at the right place, PRIMACORD cures *loading* problems. Loads may be varied according to rock strata — split into decks. Trunk line hook-ups are made with half-hitches and square knots, tied in plain sight.

Moving from hole to hole along trunk lines placed correctly, the detonating wave of PRIMACORD — which is practically instantaneous — cures *timing* problems by shooting front holes first, relieving the pressure a split second ahead of back row shots.

Acting as detonating agent for each cartridge properly placed in the hole, PRIMACORD cures *digging* problems because it gets full power out of the explosives —assures more complete fragmentation.

P-10

THE ENSIGN-BICKFORD COMPANY Simsbury, Connecticut



PRIMACORD — better than four headache cures rolled into one.

Manufacturers of
ENSIGN-BICKFORD
SAFETY FUSE
Since 1836

# PRIMACORD-BICKFORD

Detonating • Fuse •

on the Inter-Agency Committee for Construction, recently established by the office of War Mobilization and Reconversion.

Pointing out that the chief factor now retarding construction is lack of materials and equipment, Krug said that Keenan's major immediate assignment will be to assist in stepping up production of these scarce construction materials. The supply situation for construction materials is expected to ease as a result of military cutbacks and relief of manpower shortages. Lumber, cast iron soil pipe, brick, hardboard and certain types of steel have been critically short, but should ease up shortly as the WPB drive for increased production gains headway, Krug said.

**• Diesel-driven road roller flattens broad ribbon of asphalt for new military highway in the Marianas.**

*PAW Photo by Corsini*


MACHINERY TRAILERS
DESIGNED
TO TAKE IT!
THAT'S A
LACROSSE
Built by
LA CROSSE TRAILER
& EQUIPMENT CO.
LA CROSSE, WISCONSIN


## Group to Promote Inter-Regional Highway Program

Construction of a network of inter-regional highways through the eight mountain states to provide an adequate link with the Alaska Highway and travel to Canada and Alaska was urged by directors of the Mountain States Association at a meeting in Butte, Mont.

A. J. Breitenstein of Great Falls, Mont., was named chairman of a special committee to promote the inter-regional highway program and to make a report on the outlook for an early achievement of the plan.

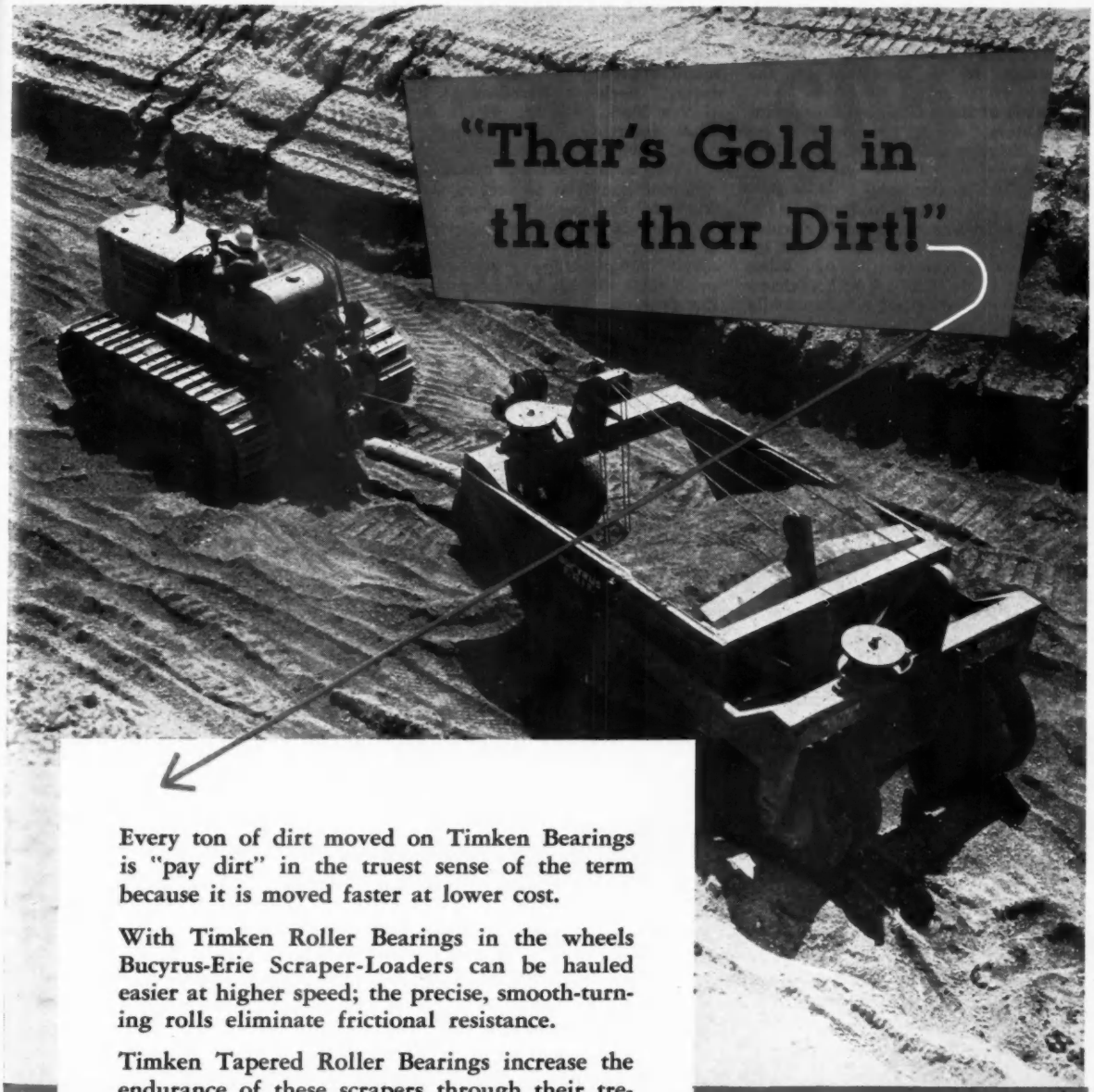
It was announced the committee would study the program as it relates to the eight mountain states of Montana, Idaho, Wyoming, Utah, Colorado, Arizona, Nevada and New Mexico. The association said that a co-ordinated system of connecting highways would provide accessibility to the Alaska highway and would facilitate tourist travel not only to Canada and Alaska, but through all the states involved.

The association also urged all states to settle their individual highway problems as quickly as possible so that they might be qualified to take advantage of funds for the federal inter-regional highway program. The association is composed of chamber of commerce secretaries in the eight mountain states.

## Ask Names for Advisory Group on Surplus Equipment

That the Surplus Property Board purposes to cooperate with and receive cooperation from the industries whose products and merchandise, commandeered for war purposes to the extent of billions of dollars, are now being and will continue to be disposed of as surplus property, is emphasized in an invitation received by the Associated Equipment Distributors (A.E.D.) from

WELLMAN
Williams BUCKETS...
Are Lighter, Stronger
Give Longer Service
Now all Wellman Buckets are welded rolled steel construction. Clamshell, Dragline, and Custom-built types—
⅜ to 16½ yd. capacities.
Send for Bulletin
THE WELLMAN ENGINEERING CO.
7062 Central Avenue • Cleveland 4, Ohio
Sales and Service Agencies in Principal Cities
ARMY
NAVY




Every ton of dirt moved on Timken Bearings is "pay dirt" in the truest sense of the term because it is moved faster at lower cost.

With Timken Roller Bearings in the wheels Bucyrus-Erie Scraper-Loaders can be hauled easier at higher speed; the precise, smooth-turning rolls eliminate frictional resistance.

Timken Tapered Roller Bearings increase the endurance of these scrapers through their tremendous load capacity and ability to handle all loads—radial, thrust or both together in any combination. They are strong factors in keeping the equipment on the job with minimum attention for lubrication and maintenance.

Performance produces preference wherever Timken Bearings are used. Make sure you have them in your construction machines—and look for the trade-mark "TIMKEN" on every bearing.

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO

**TIMKEN**

TRADE-MARK REG. U. S. PAT. OFF.

*TAPERED ROLLER BEARINGS*

the Surplus Property Board, to submit names of representative men in that industry for an Industry Advisory Committee, to be appointed by the Board.

Officials of the Associated Equipment Distributors, whose membership includes distributors and manufacturers of construction and road building machinery and equipment, in the first formal conference held in February between the then newly-created Surplus Property Board and spokesmen for industry, recommended among other things establishment of an Advisory Committee comprised of geographically selected and industry-wide representatives of this particular industry to advise and consult with the Board as to conditions in their field.

"This action by the Surplus Property Board is keenly appreciated by our industry," declared Hamilton O. Penn, of New York, President of the Association, asserting that "officials of the Board obviously recognize the important role in the post-war economic picture that must be played by the distributors and manufacturers of the hundreds of millions of dollars worth of tractors, bulldozers, cranes, power shovels and other heavy machinery and equipment without which neither the European or Japanese conflicts could have been successfully waged, aircraft, naval and armed-force might, nor even the atomic bomb, notwithstanding.

"As a matter of fact, both the European and Pacific area conflicts have been largely, to quote General MacArthur 'an engineers' war', in that the world's greatest construction job, covering millions of square miles of territory throughout the civilized world, had to be done before the fighting forces of land, air and sea could 'do their stuff'.

"The greater bulk of all the machinery and equipment supplied to the armed forces has been standard peacetime equipment which just as speedily as possible must, through the proper channels, begin doing a long-deferred job on our farms, public roads and highways and in all types of heavy construction. The fact that the Surplus Property Board perceives this situation and the problems incident to its solution, in so far as our own industry is concerned, indicates that its officials are thinking along the same lines relative to all key industries, and augurs well for the smooth and orderly functioning of one of the most difficult tasks ever assigned a group of men to handle."

President Penn announced that, following conferences between himself, members of the A.E.D.'s Executive Committee and the Association's Committee on Disposal of Government Surplus, names of industry representatives to be chosen for submission to the Surplus Property Board will be announced shortly.

## Official Word Needed to Start Highway Program

When will America's three billion dollar postwar federal-aid highway construction program get under way? James J. Skelly, president of the American Road Builders' Association answered this question at a conference of highway officials in Washington, D. C., by citing the Federal-Aid Highway Act of 1944. It provides that the funds authorized for road building under this act shall be available when the war emergency is declared over by presidential proclamation, by a concurrent resolution by Congress to that effect, or by a concurrent Congressional reso-


Big Savings

Sauerman Slackline Cableway digs sticky matrix from deep deposit and delivers 70 cu. yd. per hour to carloading hopper.

This picture shows a Sauerman Tower Machine equipped with a 2½ cu. yd. Crescent scraper bucket digging a flood control reservoir 3000' by 500' and piling the spoil to form a dam.

When you handle materials the SAUERMAN way . . .

In moving materials distances of several hundred feet or more, a SAUERMAN Drag Scraper or Cableway shows a very low cost per cubic yard because it digs, hauls and dumps in a continuous, automatic operation, doing away with the expense of rehandling. The operation is smooth and rapid, producing large yardage with moderate expenditure of power.

First cost of a SAUERMAN Machine is reasonable and maintenance amounts to very little. The simplicity of operation makes it possible to place control of even the largest installation in the hands of one operator. Moreover, the machine is very flexible, hence it is easy to adapt it to the exact needs of different jobs.

Get this Useful Booklet—Examples of all kinds of wet and dry excavation work, coal and ore handling, stock-piling and reclaiming, etc., are illustrated in the Sauerman catalog. A copy of this booklet is yours for the asking. Our engineers are at your service at all times to suggest time-saving and labor-saving methods based on their 35 years' experience.

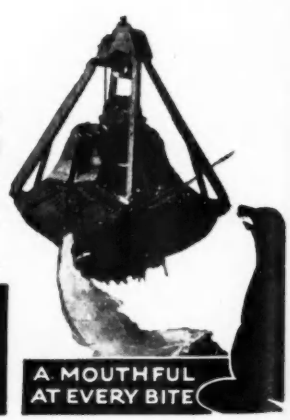
SAUERMAN BROS, INC.
574 S. CLINTON ST. CHICAGO 7, ILLINOIS

Up from the Sea

Owen dredging buckets are designed to come "up from the sea" with "a mouthful at every bite" and protected against the destructive action of water, mud and grit.

The OWEN BUCKET Co.
6095 Breakwater Avenue, Cleveland, Ohio
Branches: New York Philadelphia Chicago Berkeley, Cal.

OWEN BUCKETS



# ONE-PIECE TURNTABLE

## KEEPS MACHINERY ALIGNED

KOEHRING 605

## ONE WELDED UNIT

Machinery stays aligned on the new Koehring 1½ yard shovel. Precise alignment prolongs life of the machine, prevents undue wear, cuts upkeep cost.

## SIDESTANDS ARE INTEGRAL

Sidestands supporting the horizontal shafting on the new Koehring 605 are integral parts of the massive turntable, securely welded on, permanently joined to keep shafting in lasting alignment.

## GEAR HOUSING WELDED IN

Because a separate, bolted-on housing might work loose to throw vertical shafting out of line, the bevel swing and traction gear case on the new Koehring 605 is welded directly into the turntable. No bolts used to join housing and turntable.

*Ask For Your 605 Catalog Today*

**KOEHRING COMPANY**
MILWAUKEE 10
WISCONSIN

KOEHRING HEAVY DUTY

**HEAVY-DUTY CONSTRUCTION EQUIPMENT**

lution declaring that the emergency has been relieved to an extent that will justify proceeding with highway construction.

Mr. Skelly pointed out the act provided that $100,000,000 might have been appropriated for surveys and plans and for construction. But inasmuch as Congress did not appropriate this sum, the only federal funds that can be used now without waiting for formal action are $106,000,000 left over and unused from previous federal aid allotments. When matched by the states, it would double this amount.

"Hostilities with Germany and Japan have ceased, but the $500,000,000 of federal aid authorized by the act cannot be used for contracts made before the first postwar fiscal year which does not begin until the president or Congress takes action. In all probability, it will be the second of the concurrent resolutions that will officially launch our building program when Congress reconvenes," said Skelly.

Practically all the states have accumulated sizeable funds for road building and these may be used at once for badly needed local projects or matched against the federal funds already available," the road builders' president continued. "It is possible for states to advertise for bids to be let coincident with the official end of the emergency."

Work on the 40,000-mile interregional highway system which is to link centers of 100,000 population and upward will not commence for some months, Skelly believes. While practically all the states have filed their recommended routes with the Public Roads Administration, meetings with various state highway departments must be held before the system is finally coordinated. The integrated system will be approved in its entirety, according to the Public Roads Administration, and covers the major features of the highways involved. Initiative for the actual highways rests with the various state highway departments.

The American Road Builders' Association president called attention to the fact that the interregional system was eligible for federal aid under both the federal-aid highway and urban allotments of the act of 1944. Undoubtedly the first work done on it will be in connection with the cities, he declared. During the first year much of the work on federal-aid highways will be reconditioning and modernizing stretches that have suffered severely from heavy war emergency traffic, he said.

## Sahara Establishes Nine Scholarships at Illinois

The University of Illinois has announced formal acceptance of a scholarship fund to be known as "The Sahara Coal Company Scholarship." The awards shall be made under recommendations of the Department of Mining and Metallurgical Engineering. When there are more applications than scholarships, all other things being equal, the Committee will give preferential consideration to applicants from Saline County, Illinois, in which the Sahara mines are located, and to applicants whose fathers are now or were formerly employed by the Sahara Coal Company.

Of the nine scholarships, four are for undergraduates and are for four years; four are for master's degrees for a one-year course, and one is for a three years' doctor's degree. Sahara has established a fund at the University for these scholarships.

In formally presenting these awards on behalf of Sahara Coal Company, Chairman Henry C. Woods said:

"Never in the history of our nation has there been a greater demand for scientifically trained men as there is today, and particularly during these war years have we been woefully negligent in providing for the future. For example, after the war we shall need 35,000 more doctors than will be available, and the dearth of other specially trained men is almost in proportion. In a survey of 116 universities and colleges, placement officers reported that from three to ten positions await every available graduate.

"In a recent report Dr. Gustav Egloff, noted scientist, asserted that through sending technical students into war service, the United States has lost 150,000 potential scientists in the past


GATKE BRAKE BLOCKS

Save TIRES and TIME

GATKE Heavy Duty Brake Block

The GATKE Brake Survey System brings you the experience-proved answer to brake lining requirements for every unit you operate and saves time besides. Ask your GATKE Jobber.

Contractors and Fleet Operators from Coast to Coast find the extra performance qualities of GATKE *CUSTOM-BILT* Brake Blocks important aids to efficient and economical operation.

The smooth, non-grabbing action reduces strain on equipment and adds countless miles to tire life.

Dependable stopping power under all service conditions means Extra Safety for men and equipment.

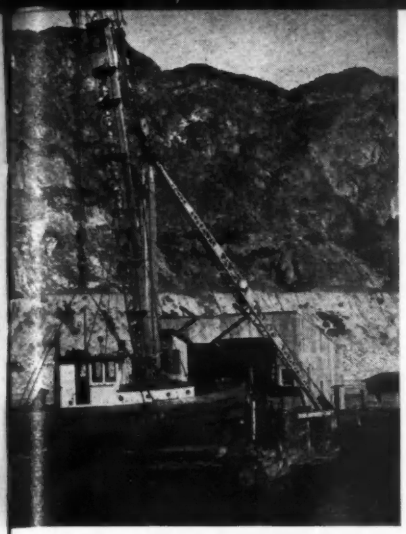
The long wear life means fewer adjustments and less maintenance.

Try GATKE Brake Blocks for your next 5 relines. Compare results with the best you ever had. Ask your GATKE Jobber or write for particulars.

Gatke CUSTOM-BILT BRAKE LININGS

BLOCKS SETS ROLLS SHEETS

GATKE CORPORATION 228 N. La Salle Chicago 1, Ill.



• Repainting the 22-ton tug Blue Ox by the Bureau of Reclamation became a simple job through the use of rubber-covered slings and a derrick. Here the 43-foot boat has been hoisted from the water so maintenance men can prepare her for her coming job of handling barges used in dredging work in the Columbia River below Grand Coulee Dam.

three years and indications are that another 100,000 will be lost in the next two years.

"The atomic bomb was developed through a backlog of U. S. scientists trained before the war, but unless steps are taken at once to return men to school, we will likely not have this backlog for future crises.

"During the past twenty-five years, coal has made phenomenal progress in the world of science. Nylon, the sulfa drugs, and innumerable other history-making discoveries have been made by scientists using coal as their basic ingredient. To help develop further and as yet perhaps undreamed uses for coal, as well as to produce the maximum of efficient heat and power with coal, these Sahara Scholarships have been established."

## Award Contract on Deschutes Job

Award of a contract for $245,290 to W. C. Thompson of San Francisco, for further construction on the irrigation system on the Deschutes Project, near Bend, Oregon, has been authorized by Secretary of the Interior Harold L. Ickes.

The contract covers earthwork and structures for laterals and sublaterals on the north unit of the project. Construction was stopped in December 1942 by order of the War Production Board, and resumed in September 1943, under the war food program to provide irrigation for 20,000 of the 50,000 acres of the north unit.

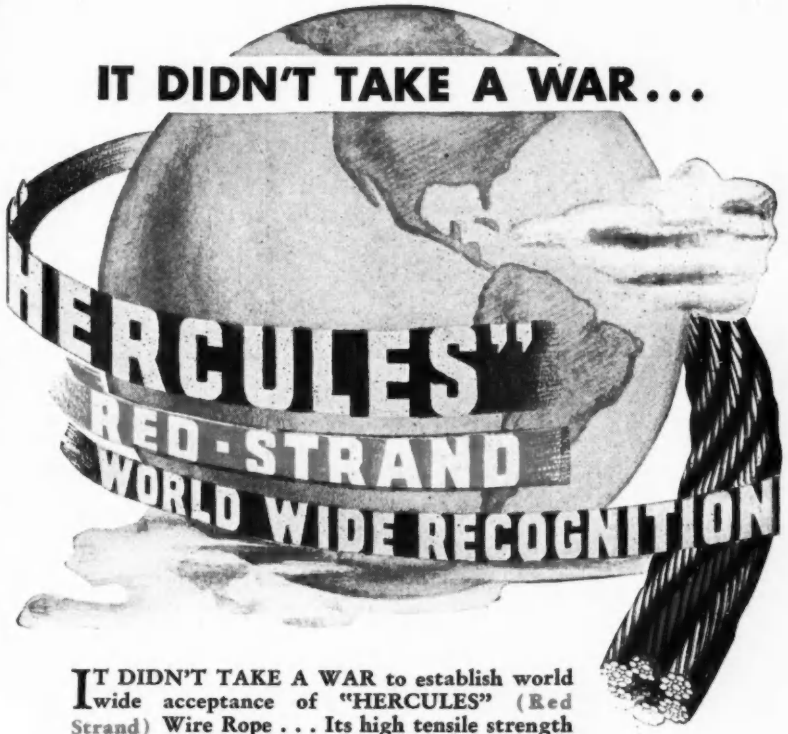
Commissioner Harry W. Bashore of the Bureau of Reclamation said that the water supply for the north unit will be obtained from storage in the Wickiup Reservoir, now under construction by the Bureau on the Deschutes River approximately 40 miles upstream from Bend. Supplemental water is being furnished to established irrigation districts from storage in the Crane Prairie Reservoir.

## Colonel Renshaw District Engineer of New York

Colonel Clarence Renshaw has assumed command as District Engineer of the New York District of the U. S. Engineer Office to succeed Colonel Edgar W. Garbisch. The new District Engineer is a graduate of West Point and has also received the degrees of B.S. and M.S. from the Massachusetts Institute of Technology.

Since his assignment to the Corps of Engineers, Colonel Renshaw has been in charge of many large projects. In 1941, he was District Engineer of the Arlington Engineer District and directed the design and construction of the Pentagon Building. From 1942 to 1944, he served as District Engineer of the Washington, D. C. and Philadelphia Districts, respectively.

Reports submitted by Colonel Renshaw to the Office of the Chief of Engineers, upon his return from the European Theatre of Operations in 1944, proved most valuable in planning the equipment of Engineer port repair ships, hopper dredges and the technical

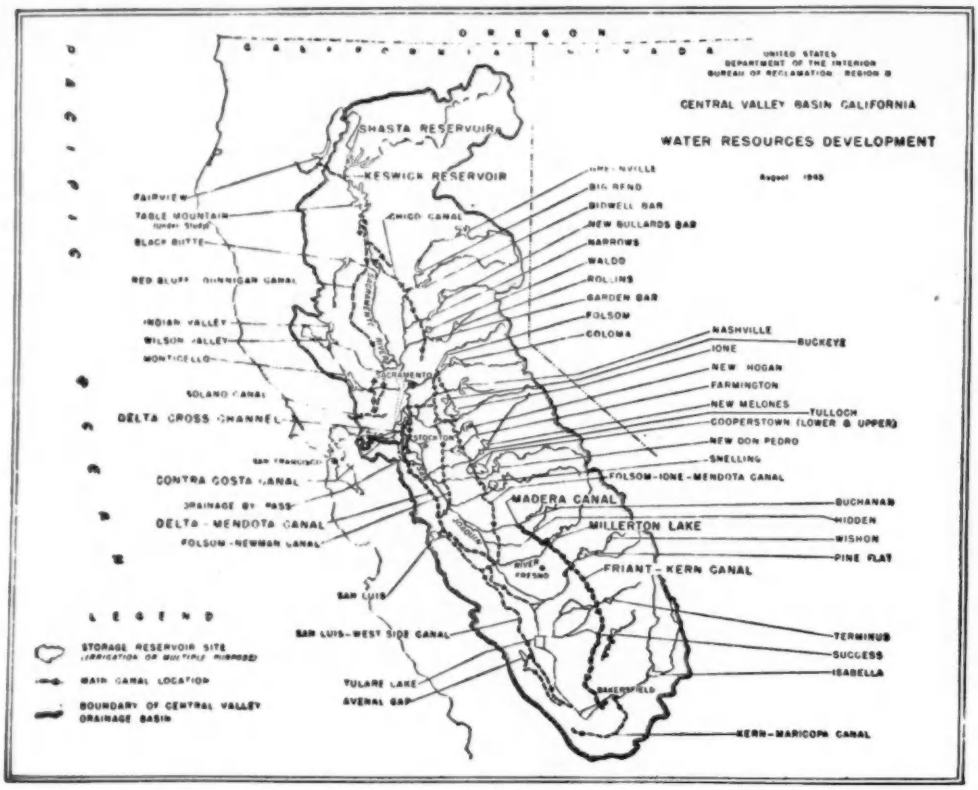




IT DIDN'T TAKE A WAR to establish world wide acceptance of "HERCULES" (Red Strand) Wire Rope . . . Its high tensile strength *plus* exceptional ability to withstand wear and fatigue, has long been recognized throughout the world.

There is a correct type and construction of "HERCULES" (Red Strand) Wire Rope for every heavy duty purpose, and its far flung use is due to its unwavering ability to give safe, dependable and economical service *anywhere*—on any job!

Feel free, always, to consult our Engineering Department on the use, care and application of wire rope.

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
WIRE ROPE MAKERS — ESTABLISHED 1857
5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.
NEW YORK • • • 90 West Street
CHICAGO • • 810 W. Washington Blvd.
DENVER • • • 1554 Wazee Street
SAN FRANCISCO • • 520 Fourth Street
PORTLAND • • 914 N. W. 14th Avenue
SEATTLE • • 3410 First Avenue South




**• Central Valley Project of the Future? This map shows the location of dams proposed by the Bureau of Reclamation for ultimate development of all available waters of the Central Valley Basin. It will take years and many millions of dollars to complete this long-range development, but the Bureau proposes an immediate 15-year program of dams, canals, power lines and other works that would add a million acres to the Great Valley's irrigated area, provide farm homes for demobilized service men and war workers, furnish jobs for 18,000 men and help balance the State's new industrial economy with its new farm needs.**


OVER 25 YEARS
A BUILDER OF
BUCKETS

*Thousands of these*
ERIE 2-LINE CLAMSHELLS
*serve today on All Fronts*

• This Erie 2-Line Clamshell has been selected by the U.S. Army and Navy to serve on all fighting fronts. They combine block and tackle plus leverage to achieve the greatest digging force available in a clamshell design whether reeved 2, 3 or 4 parts of line. Write for new bulletin.

Address: - 4510 Geist Road

ERIE STEEL CONSTRUCTION CO.
ERIE, PENNSYLVANIA
*Aggre Meters • Buckets • Concrete Plants • Traveling Cranes*


training of their crews, which were being utilized in the repair of ports damaged by the retreating Germans.

As the New York District Engineer, Colonel Renshaw will direct all military construction within the Second Service Command (which territory includes New York, New Jersey and Delaware), the Engineers' Supply program, the maintenance of rivers and harbors, and flood control projects within New York City and Long Island, most of eastern New York State, northern New Jersey and western Vermont.

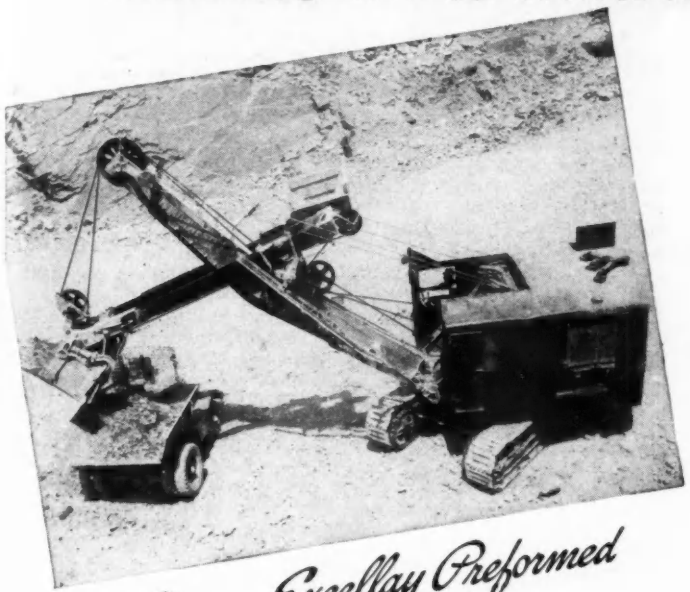
## Texas to Build 2,162 Miles of Roads in 12 Months

Construction within the next 12 months of 821 miles of primary highways and 2,162 miles of secondary roads, at an estimated total cost of $53,000,000 was approved by the Texas State Highway Commission.

Also approved by the Texas commission was a program providing for construction in the second and third postwar years of 1,624 miles of major highways and 4,358 miles of secondary roads, at a total cost approximating $100,000,000.

With planning for the postwar construction program under way for the last three years, it was announced that detailed plans for the first year's program were nearing completion. The commission authorized its engineers to proceed with planning of second and third-year work. Cities and counties, it

## Tireless TIGER BRAND helps you *handle more material per day!*



*Excellay Preformed*

DAILY tonnage depends upon keeping equipment *actively* on the job. Time out for repairs, replacements or adjustments cuts down productiveness—cantankerous lines also lower efficiency of materials handling machines. That's why contractors and operators prefer TIGER BRAND Wire Rope.

U·S·S American TIGER BRAND Excellay Preformed Wire Rope has *Stamina* to stand up under the hardest usage encountered in grueling work of this kind. *Strength, Toughness* and *Flexibility* are reflected in the longer, trouble-free service it gives.

TIGER BRAND's high resistance to bending fatigue, its ease of handling and non-kinking, non-rotating characteristics are built-in advantages that will make your wire-rope-rigged equipment more efficient.

Prepare now for the busy days ahead. Check over your equipment. Plan to re-rig with TIGER BRAND—and *be sure to specify* TIGER BRAND Wire Rope when buying new equipment.

**EVERY SUNDAY EVENING,** United States Steel presents *The Theatre Guild on the Air.* American Broadcasting Company coast-to-coast network. Consult your newspaper for time and station.

AMERICAN STEEL & WIRE COMPANY
*Cleveland · Chicago · New York*
COLUMBIA STEEL COMPANY, *San Francisco*
United States Steel Export Company, New York
UNITED STATES STEEL

U·S·S AMERICAN
# TIGER BRAND *Wire Rope*

*are you looking for an*

**EXCELLENT HARD FACING** *electrode?*

**AGILE**

**DARK GREEN ELECTRODES**

can be applied to the worn surfaces and edges of steel, malleable and cast-iron. The weld is a chromium-carbon steel with high hardness which gives excellent wear resistance. This electrode performs equally well with AC or DC welding machines.

APPLICATION: We recommend this electrode for the hard facing of:—machine parts, excavating buckets, plows, shovel teeth, worn tools, switches, crossovers, valves, dies, etc.

ANNEALING: 10-15 hours at 1460° F. and slow cooling will reduce the hardness of the weld metal from 600 to 280 Brinell.

FORGING: The weld deposit can be forged at 1800° F.

PRICES: AGILE Dark Green electrodes are packaged in 10-lb. containers at the following prices per pound:

| | |
|---|---|
| 3/16" diameter | $ .52 per lb. |
| 5/32" diameter | .56 per lb. |
| 1/8" diameter | .60 per lb. |

AGILE ACTARC

**AMERICAN AGILE CORPORATION**

5806 HOUGH AVE.

CLEVELAND 3, OHIO

**• General view of downstream side of concrete spillway for Shadow Mountain Dam, near Grand Lake, Colorado, as J. F. Shea Company, Inc., of Los Angeles, contractors, installed the two 21,650-pound radial, float-controlled gates which will control the level of the reservoir, part of the Colorado-Big Thompson trans-mountain water diversion project of the Bureau of Reclamation. A roadway will lead across the top of the spillway and across the earth-fill dam, right, which will impound waters of the North Fork of the Colorado River.**

was added, would be asked to arrange for right of way on projects as soon as possible.

Commission Chairman John S. Redditt said the three-year program will absorb all states and federal funds expected during the period. It may be necessary to remove from the list projects where right of way is incomplete and substitute jobs of equal merit so the program can move along without interruption, it was explained.

Redditt said the commission's action, together with advance engineering work already done in the highway department, would allow work to begin just as soon as approval came from Washington.

The commission ordered uniform striping on all Texas highways.

## Form Agricultural Division of Crushed Stone Group

Following initial action started at the annual convention last January, an agricultural division of the National Crushed Stone Association has been formed.

The new division is self-governing and has its own chairman, executive committee, and board of directors. It formulates its own policy. Howard M. Thomas, Fort Scott Hydraulic Cement Co., Ft. Scott, Kansas, is chairman. Henry A. Huschke is managing director of the division.

## New York Expects to Complete $35,000,000 of Road Plans

New York State expects to complete about $35,000,000 of highway construction before the end of the current year, it was announced by State Public Works Superintendent Charles H. Sells after federal curbs on road building were lifted.

Main part of the current-year program is centered on projects such as relocation of existing roads and reconstruction where most urgently needed.

No work on the proposed throughway from New York to Buffalo is planned for this year.

Sells was informed by the New York State Highway Chapter of the Associated General Contractors that it could easily absorb all of the $35,000,000 worth of work proposed for completion this year in various parts of the state.

"I am very pleased that permission (from the War Production Board) has been granted to go ahead with our program to work on our highways," Sells said. "We are all ready, our plans have been completed; substantial rights of way have been obtained and the work we will do at once does not involve the federal appropriation of $100,000,000 which we expect Congress will shortly authorize. However, this will be for work to follow what we are now just aching to start.

"One of the first moves to speed up the program will be to employ some 1,700 additional engineers, the force will be increased to three times its present size. The budget has been approved, the Civil Service Commission has given its consent and the present force will be augmented as speedily as possible."

## Start Construction of Maine Turnpike Next Spring

Construction of the Maine Turnpike, a four-lane, streamlined superhighway with airplane landing strips, to run be-

tween Kittery and Fort Kent, will be started next spring, according to an announcement by Gov. Horace A. Hildreth and members of the Maine Turnpike Authority.

First section to be constructed will be a 50-mile strip between Kittery and Portland, to cost an estimated $13,000,000. Revenue bonds, amortized by tolls, will finance the project. The toll rate will be 50 cents per passenger car, and $1.25 for trucks, based on a traffic estimate of 2,000,000 vehicles per year.

Scheduled for completion in 1948, the first section will connect with a similar highway already surveyed in New Hampshire which, in turn, will connect with another in Massachusetts, and so on through Connecticut and New York. The Kittery-Portland section has been designed to eliminate 90 per cent of highway causes of accidents and to decrease traveling time between these points by 30 minutes.

Officials announced that surveys for the second section of the turnpike, between Portland and Brunswick, would be made at an early date. The third section will run between Brunswick and Augusta, with a fourth between Augusta and Bangor, and a fifth between Bangor and Fort Kent.

Joseph T. Sayward of Kennebunk, chairman of the Maine Turnpike Authority created by the 1941 Legislature, said the four-lane highway would have two 24-foot roadways separated by a 26-foot dividing strip, with four-foot treated gravel shoulders on the outside lanes. It will be located west of the present U. S. Route One, principal highway entrance into Maine. Plans include at least two airplane landing strips built adjacent to the highway. The turnpike will have no cross-roads, no traffic signals, no roadside bill boards, and no pedestrian travel. There will be only 18 curves, none sharper than 1 per cent, in the entire 50 miles of the first section.

"In view of the competition we can expect for the nation's tourist business from other recreational states," said Governor Hildreth, "Maine must have such a superhighway if we are to protect fully our $108,000,00 tourist business. One of the best ways to keep this business and to compete successfully for new business is a superior means of highway travel."

## Crushed Stone Association Safety Competition

The frequency and severity rates of injuries at the crushed stone operations enrolled in the 1944 Safety Competition were slightly lower than in 1943. A total of 36 operations—32 quarries and four underground mines—were entered in the 19th annual accident-prevention contest conducted by the Bureau of Mines, United States Department of the Interior in cooperation with the National Crushed Stone Association. These plants were worked 4,723,929 man-hours during 1944 with an injury-frequency rate of 32.6 per million man-hours and an injury-severity rate of 7.1 per thousand man-hours of exposure to plant hazards. Of the 36 operations, 11 had no lost-time accidents during the year.

The Marquette limestone quarry of the Marquette Cement Manufacturing Company at Cape Girardeau, Missouri had the best safety record in 1944, and the bronze plaque provided by the Explosives Engineer magazine was awarded to this operation. Employees worked 84,374 man-hours throughout the year without a disabling accident. The Marquette quarry has been enrolled each year since the competition started, and of these 19 years, 14 were free of accidents. During its participation, the quarry has won the trophy four times and has received honorable mention ten times.

Ten plants received honorable mention for operating throughout the year with accident-free records and were awarded parchment reproductions of the quarry scene on the bronze plaque. Each employee of a plant that has an accident-free record is presented with a Certificate of Honor for his part in preventing accidents. The ten plants are as follows:

Martinsburg limestone quarry, North American Cement Corporation, Martinsburg, Berkeley County, West Virginia; 82,370 man-hours.

White Haven sandstone quarry, General Crushed Stone Company, White Haven, Luzerne County, Pennsylvania; 62,922 man-hours.

Union Furnace limestone quarry, Warner Company, Tyrone, Huntingdon County, Pennsylvania; 55,319 man-hours.

Security limestone quarry, North American Cement Corporation, Hagerstown, Washington County, Maryland; 48,716 man-hours.

No. 4 trap-rock quarry, Southwest Stone Company, Knippa, Uvalde County, Texas; 43,698 man-hours.

Jordanville limestone quarry, General Crushed Stone Company, Jordanville, Herkimer County, New York; 43,047 man-hours.

Dunbar limestone mine, New Castle Lime and Stone Company, Dunbar, Fayette County, Pennsylvania; 42,578 man-hours.

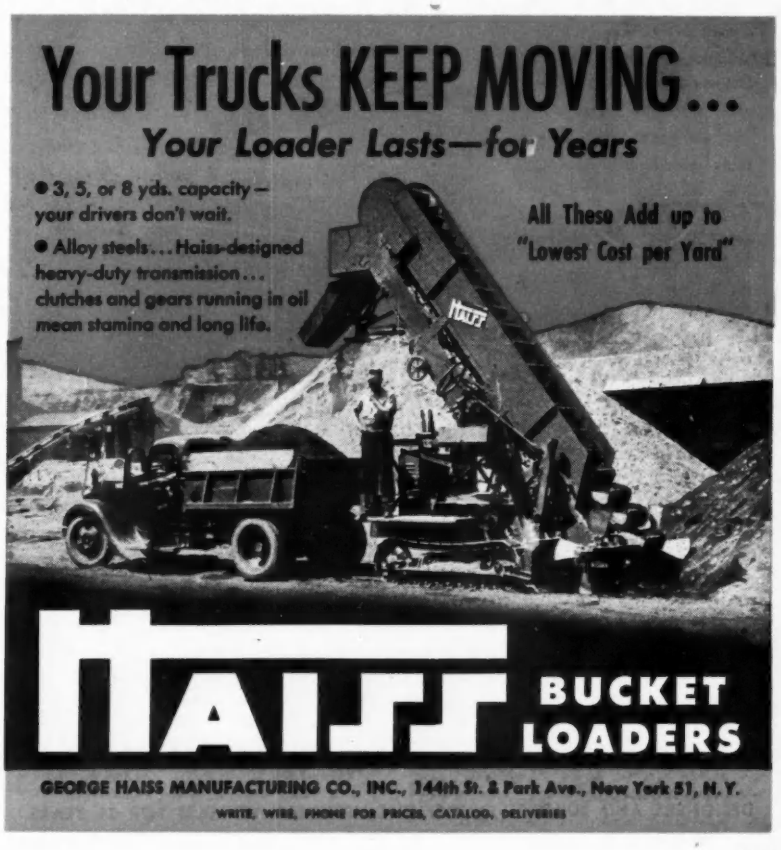
Catskill limestone quarry, North American Cement Corporation, Catskill, Greene County, New York; 33,760 man-hours.

Winchester trap-rock quarry, General Crushed Stone Company, Winchester, Middlesex County, Massachusetts; 19,703 man-hours.

Middlefield No. 1 quarry, New Haven Trap Rock Company, Wallingford, New Haven County, Connecticut; 14,943 man-hours.

All 36 plants enrolled in 1944 were also enrolled in 1943. Four of these plants had accident-free records in both years; 17 had better severity rates in 1944; and 15 had worse severity rates in 1944.

Sixty-three per cent of the accidents, for which causes were given, resulted from falls of persons, handling materials or objects, haulage, and hand tools. These same causes accounted for



Your Trucks KEEP MOVING...
Your Loader Lasts—for Years
● 3, 5, or 8 yds. capacity—your drivers don't wait.
● Alloy steels... Haiss-designed heavy-duty transmission... clutches and gears running in oil mean stamina and long life.
All These Add up to "Lowest Cost per Yard"
HAISS
BUCKET LOADERS
GEORGE HAISS MANUFACTURING CO., INC., 144th St. & Park Ave., New York 51, N. Y.
WRITE, WIRE, PHONE FOR PRICES, CATALOG, DELIVERIES

40 per cent of the days of disability.

All contracts, except those relating to civil projects under the Chief of Engineers, will be awarded under the First War Powers Act and Executive Order No. 9001, and the Act of 2 July 1940, as continued in effect by the Act of 5 June 1942.

## OBITUARIES

### Charles E. Carey

Charles E. Carey, 55, Regional Director of the United States Bureau of Reclamation, with headquarters in Sacramento, died September 2, in Veterans Hospital, Sawtelle, California, after an illness of several months.

Mr. Carey had been the Chief Administrative Officer of the Reclamation Bureau in Northern California since September 1943 when he was appointed Regional Director by the Secretary of the Interior.

He was born in Clarksville, Arkansas and graduated from the University of Oklahoma with a B.S. Degree in Engineering in 1914, and with the Degree of Electrical Engineer in 1917.

Mr. Carey was employed by electrical contractors and private utilities in Texas and Missouri from 1914 to 1920, after which he became Head of the Department of Electrical Engineering at the University of New Mexico. In 1923, he became General Engineer and Engineering Supervisor for the Westinghouse Company at East Pittsburgh, Pa., and at Seattle, Washington. In 1934 he established a private consulting practice which he maintained until 1937. During this period he was Consulting Electrical Engineer to the National Resources Committee in the Pacific Northwest.

In 1937, Mr. Carey joined the staff of the Bonneville Power Administration at Portland, Oregon, and during the succeeding five years, advanced progressively from Rate Engineer to Chief Consulting Engineer and Assistant Chief of the System Planning and Marketing Division.

In May 1942, Mr. Carey was appointed Chief Budget Examiner of the U. S. Bureau of the Budget, a position he held until he was appointed Regional Director for the Reclamation Bureau.

Mr. Carey contributed his engineering knowledge and skill to the development of the Skagit River hydroelectric system for Seattle, the Cushman project of Tacoma, and the Chelan development of the Washington Water Power Company. His career was associated closely with all of the major power and industrial developments undertaken in Washington, Oregon, Idaho, and Montana during the decade 1924 to 1934.

Mr. Carey is survived by his widow, Verle Carey of Sierra Oaks Vista, Sacramento, and a daughter, Marjorie, who is a student at the College of the Pacific in Stockton.

### Lloyd Sumner Burdick

Lloyd Sumner Burdick, district representative for Caterpillar Tractor Co. in North Dakota, Montana, Alberta and Saskatchewan, was killed August 9 when two sections of the Great Northern's transcontinental train, the Empire Builder, collided at Michigan, North Dakota.

Mr. Burdick was born August 8, 1908 at Assumption, Illinois where he attended the rural schools. He was graduated from Morgan Park Military Academy at Chicago and later attended the University of Illinois, receiving his B.S. degree in 1931. At Illinois he was a gridiron mainstay and recognized as an All-American tackle.

He attended law school at the University of Detroit and the University of Michigan, played professional football with the Chicago Bears and Cincinnati and was head football coach at Knox College, Galesburg, Ill. before joining "Caterpillar's" sales department in 1935.

From 1939 until 1942 he was associated with the Wm. H. Ziegler Co., "Caterpillar" distributor at Minneapolis. Recognizing his country's need for men of his experience, he resigned this position and joined the U. S. Corps of Engineers, earning distinction as a mechanical engineer throughout the Northwest, and on the Alaska Highway. He returned to "Caterpillar" in 1944 as district representative.

Mr. Burdick is survived by his widow, the former Ellen Brayshaw of Morton, Illinois and two children, all of Great Falls, Montana, and his parents, Mr. and Mrs. Charles S. Burdick of Blue Mound, Illinois.


LINN HAFTRAKS
WITH FULLY ENCLOSED OR OPEN CABS

THERE is a type of cab and body for any service, in any climate. The built-in strength and balance, with ample power, permit the rugged Linn Haftraks to carry their loads in all kinds of weather—the world around, the year around. Linn Haftraks and Traktrailers are built from 5 to 50 tons capacity. Send for catalog.

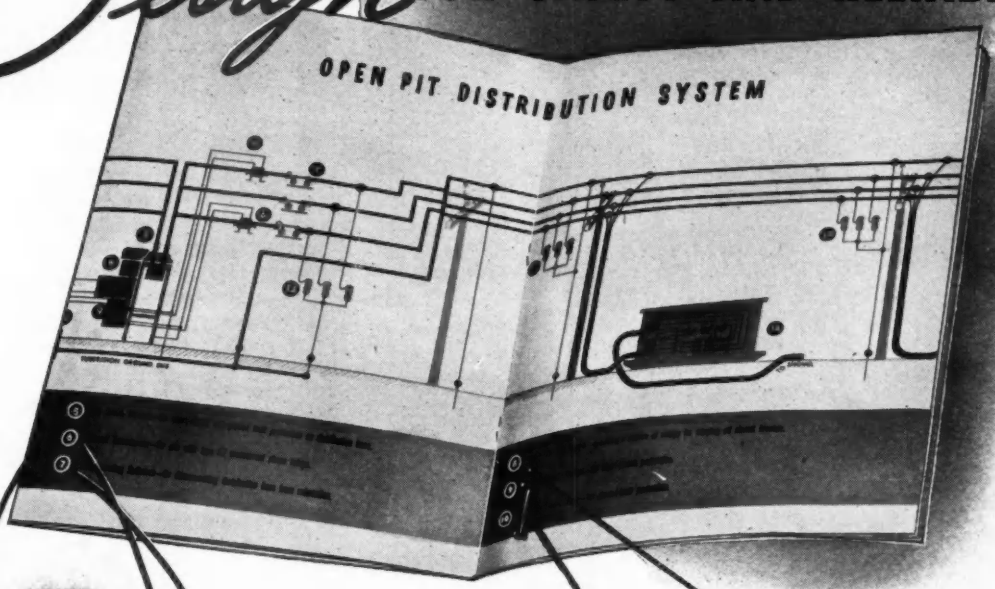
THE LINN MANUFACTURING CORPORATION
Morris New York

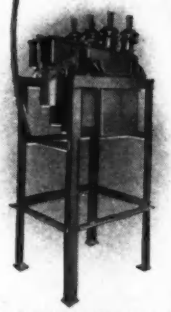
DESIGNERS AND BUILDERS OF OFF-THE-HIGHWAY VEHICLES FOR 29 YEARS.

It's easier to lift, lower, push or pull the Simplex Way!

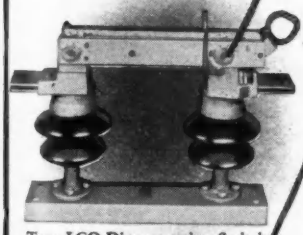
Simplex
LEVER · SCREW · HYDRAULIC
Jacks
for every construction purpose
Awarded the Gold Medal for Safety
Ask for Catalog 44
Templeton, Kenly & Co., Chicago 44, Ill.

# *Design* FOR SAFETY AND RELIABILITY

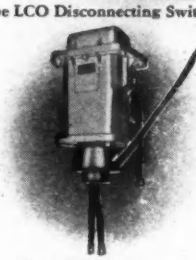


Type FO-22-A Outdoor Oil Circuit Breaker.



Type LCO Disconnecting Switch



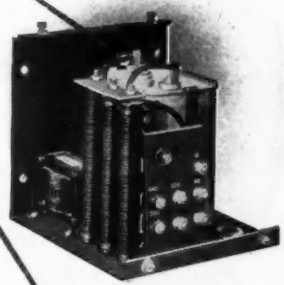
Type WO-15 Current Transformer

In open-pit mining, there is only one way to assure peak production with complete safety for your employees. Be sure your distribution system has been *designed* to include *every* factor for safety and reliability.

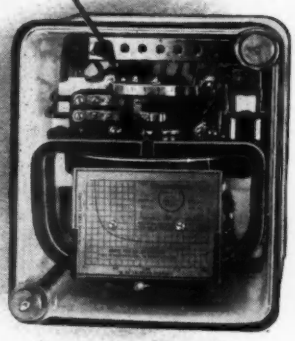
Perhaps your present system is entirely adequate. But it will pay you to check it against accepted standards. Usually, adequate protection can be secured with few changes. Additional equipment may not be necessary—or a few inexpensive protective devices may turn the trick.

To help you in determining whether or not your present system needs a thorough check-up, Westinghouse has prepared a new book on the important subject of open-pit distribution systems. It explains the equipment needed for safety and reliability—and tells why. Complete diagrams, like the one illustrated above, clearly show the advantages you get with the correct equipment. Write today for your copy of B-3282. And if you need the additional help of our engineering staff, just call our nearest office. You'll get their immediate co-operation. Westinghouse Electric Corporation, Dept. 7-N, East Pittsburgh, Penna.

J-94610



Capacitor Trip Device with cover removed.



Type CO Over-current Relay.

**Westinghouse**

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

*Electrical Equipment for the Mining Industry*

• With Mt. Surabachi as a background this plane lands on a party finished airfield shortly after the Iwo invasion.

## *Paving Matoyama . . .*

*(Continued from page 551)*

tank wagons from a transfer bin built mostly of Japanese materials. The use of penetration paving, which was mixed in place on the runway, relieved the hot mix plant considerably, and has so far proved strong enough to handle fighter planes and medium bombers which used these fields.

Hot mix asphalt was batched out of a portable plant set up near the north end of Iwo. Hot mix asphaltic concrete came out of this plant at the rate of 120 tons per hour, hauled by four-ton dump trucks and spread in 10-ft. courses by spreading machines. Tandem five to eight-ton smooth rollers ironed this pavement until it would no longer "give." Many a B-29 shot up or low on gasoline, owes its existence today to the work the Seabees and army boys did on the airstrips.

### Planes Cause Loss Time

As a matter of fact, the work literally had been carried on while the planes were taking off. Commander Henderson of the Seabee Regiment estimated that 25% of the possible effective working time of motor grader operators had been lost because they had to be on the alert for planes either landing or taking off. One strip, half finished, was immediately put in use by the air force while the tractors, scrapers, trucks and graders were working on the other half.

It was no trouble to get a picture of a tractor and an airplane. All you had to do was point a camera at a tractor.

The work was divided between Seabees and Army Engineers as follows: One Army Engineer Battalion specialized in surfacing, and the construction of some of the "hard stands", where mechanics service planes. This battalion started its work at Iwo on April 28. The Seabees were assigned the majority of four battalions to earthwork, grading, surfacing, crushing rock, mixing hot asphalt and making penetration macadamized paving. A few Seabees from another regiment were also used on this work. All construction was carried forward by men working two 10-hour shifts seven days per week.

When the work got well on schedule, the shifts were cut to nine hours.

*(Continued on page 586)*

**THE DONALDSON PRE-CLEANER**

***SAVES TIME • SAVES OIL • SAVES ENGINES***

Mounted on the air cleaner intake tube, the Donaldson Collector Pre-Cleaner removes from 50 to 75% of the air-borne dust before it reaches the oil-washed main cleaner. The interval between servicing the oil cup can therefore be at least twice as long . . . saving time and oil, too! Pre-Cleaner discharges dust into the easily emptied transparent collector cup. After some experience the operator can determine when main cleaner needs servicing by the dust-level in this cup. The Donaldson Pre-Cleaner fits any make of air cleaner with center tube intake.

*Standard equipment on many makes of machines*

*Write Today!* →

**EQUIP YOUR MACHINERY NOW!**
See your road or construction machinery dealer or distributor. If he is unable to supply you write direct giving dealer's name.

**DONALDSON** COLLECTOR PRE-CLEANER

Donaldson Co., Inc. · 666 Pelham Blvd. · St. Paul 4, Minnesota

## on levees

Constructora del Sur is using 2 Tournapulls to build 2½ miles of select earth levee with very little sand content near Suchate, Mexico. This, in a country made up largely of sand, requires stripping sand overburden from small scattered earth seams. Next, earth is hauled and spread on the dike in uniform 8" layers. On this job Tournapulls tripled the output of similar capacity crawling tractor-scraper combinations.

## on reservoirs

Peter Kiewit Sons Company used 3 Super C Tournapulls on this 600,000-yard reservoir job near Des Moines, Iowa. Working in moist, sandy clay, each unit loaded in 50 to 60 seconds, averaged 3,000-foot cycles every 6 minutes, delivered 120 pay yards per 60-minute hour. Tournapulls are the low-cost dirt-moving answer for your water control contracts.

## on stripping

C. Arrington replaced a shovel and four 3-yd. trucks with 2 Super C Tournapulls on iron mine near Cedartown, Ga. These mobile rigs locate and strip ore pockets, load the ore, haul and dump to grizzly. Return grades run to 14%, average 10.5%; hauls vary from 1/2 to 4/10 mile one way. Ability to sample, strip or load ore — anywhere at any time — is a big Tournapull advantage on mining jobs like this.

## on railroad grading

Here is another Kiewit job — 6 Tournapulls helped move 2,300,000 cu. yds. on a 23-mile relocation of Rock Island line between Perlee and Eldon, Iowa. Material handled was typical wet, sticky Iowa gumbo. Kiewit's repeat orders prove that they have found Tournapulls are the profitable answer for all types of earthmoving.

## on job-to-job moves

Green Construction Co. saved time and money by driving 5 Tournapulls over state highways from Peoria, Illinois, to Oaktown, Indiana, 205 miles, in 13 hours' driving time. For hauling dirt on or over pavement and for economical job-to-job moves, Tournapulls with their big (5'6") rubber tires, are the answer.

**PULLS**

Trade Mark Reg. U. S. Pat. Off.

Tournapulls have repeatedly proved their profit-making ability in all these fields by: (1) adaptability to all haul distances, (2) high speed for quick completion, (3) ability to profitably handle large or small jobs, (4) hauling over pavement. Let your LeTourneau distributor show you why all these cost-cutting advantages make Tournapulls your best bet for lowest net cost per yard. See him TODAY.

C28A

## Paving Matoyama . . .

*(Continued from page 582)*

and Commodore Johnson issued orders wherever possible to grant men one day off per week. Many of these men lived in foxholes without baths, rationed on water, eating K-rations, battling the job.

After all the grading was finished on the fueling loop over at No. 2 airdrome, soldiers came in one day and captured 52 live Japanese in caves at the edge of the strip. How many times would you suppose that these same Japs looked down the sights of a rifle, made in Japan, at the head of some American boy busy with his grading? The operators know it happened, and they still shudder.

But the monkeys are crazy. They shot at tires.

## Safe Load Indicator . . .

*(Continued from page 554)*

machines are operated most of the time with a minimum of counterweight, additional blocks being added only when required for a particular job. In the tabulation covering this machine, it was assumed that 5,000 lbs. of extra counterweight could be added. Table V shows the increase in safe load capacity resulting from this additional counterweight when the machine is operating over the side. This would not be shown as permissible by the safe-load indicator.

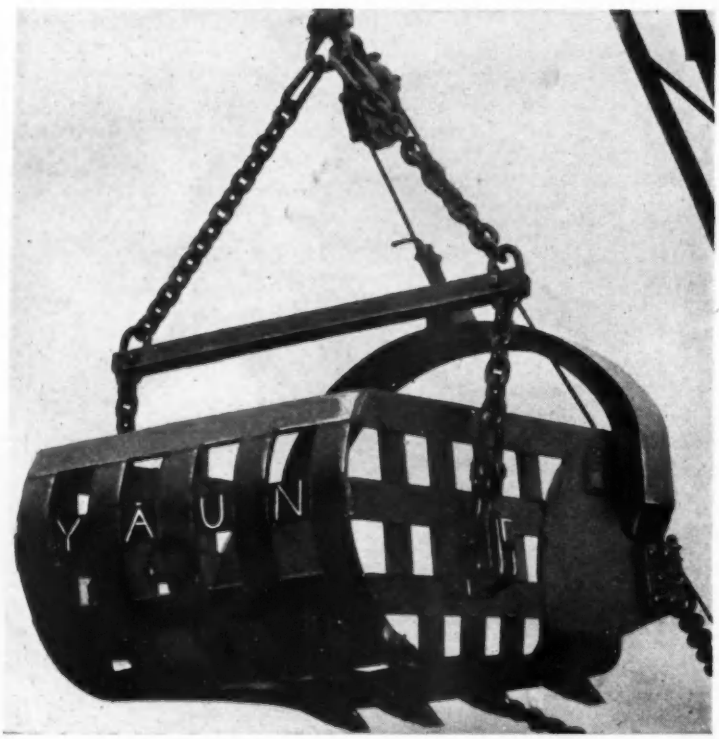
The additional capacity shown in Table V is about equal to the increase shown in Table I for operation over the end of the crawlers. However, this relationship is largely coincidence and will not hold at all generally. Furthermore, the machine with extra counterweight will have still greater capacity over the ends of its crawlers, for which provision also should be made in the indicator readings.

The machines discussed here are used for general work. Although possibly purchased for a specific job, the buyer has in mind its possible use on other jobs which may last one day to several months. Mobility and compactness are prime requisites; minimum weight for low haulage charges and to cross bridges on secondary highways; short boom to move through city streets; low A-frame to clear underpasses; minimum rear end clearance to work in close quarters or to avoid blocking traffic. But as the machine is designed for excavator service it has the mechanical strength to support greater loading; therefore, provision is made to give it extra stability or greater reach or both to meet the requirements of some unknown job which may develop in the future.

Since the machines are used on miscellaneous work, often of a type with which the operating crew may have had no previous experience, a safe-load indicator easily might be instrumental in avoiding a serious accident. But to be effective it must be reasonably accurate for all conditions under which the machine may be used. It seems out of the question to make an instrument which will be adjustable by the operating personnel to suit all the possible combinations of the conditions listed, because of the complications involved, the time required to make the adjustments and check calibration, and the lack of experience in this specialized work.

Therefore, if safe-load indicators are to be made practical for mobile cranes in this general type of work it will require the cooperative efforts of, and compromises between the user, the instrument manufacturer, and the designer of the machine. The user may have to give up the privilege of changing the number of parts in the hoist tackle; the instrument may have to be adjustable readily for vari-

*(Continued on page 590)*


**YOUR MONEY-MAKER ON POST-WAR JOBS**

Now that the war is over and post-war competition has arrived, you, the dragline owner, must make every dollar count in order to "come out of every pit with a profit." You can enter a lower bid on jobs if your dragline is equipped with one of Yaun's basket-type buckets.

Here's Why:

1. This all-welded bucket is at least one-third lighter than conventional buckets of similar capacity.
2. It will handle any loose material except "soup." It swings drier dirt, fills fast, and has no back pressure.
3. Easier on the operator. Cuts dump shock, no suction, and dumps 100 per cent clean in stickiest dirt.
4. More cycles per hour, more dirt moved per cycle with maximum ease to operator and dragline. Job proven for long life.

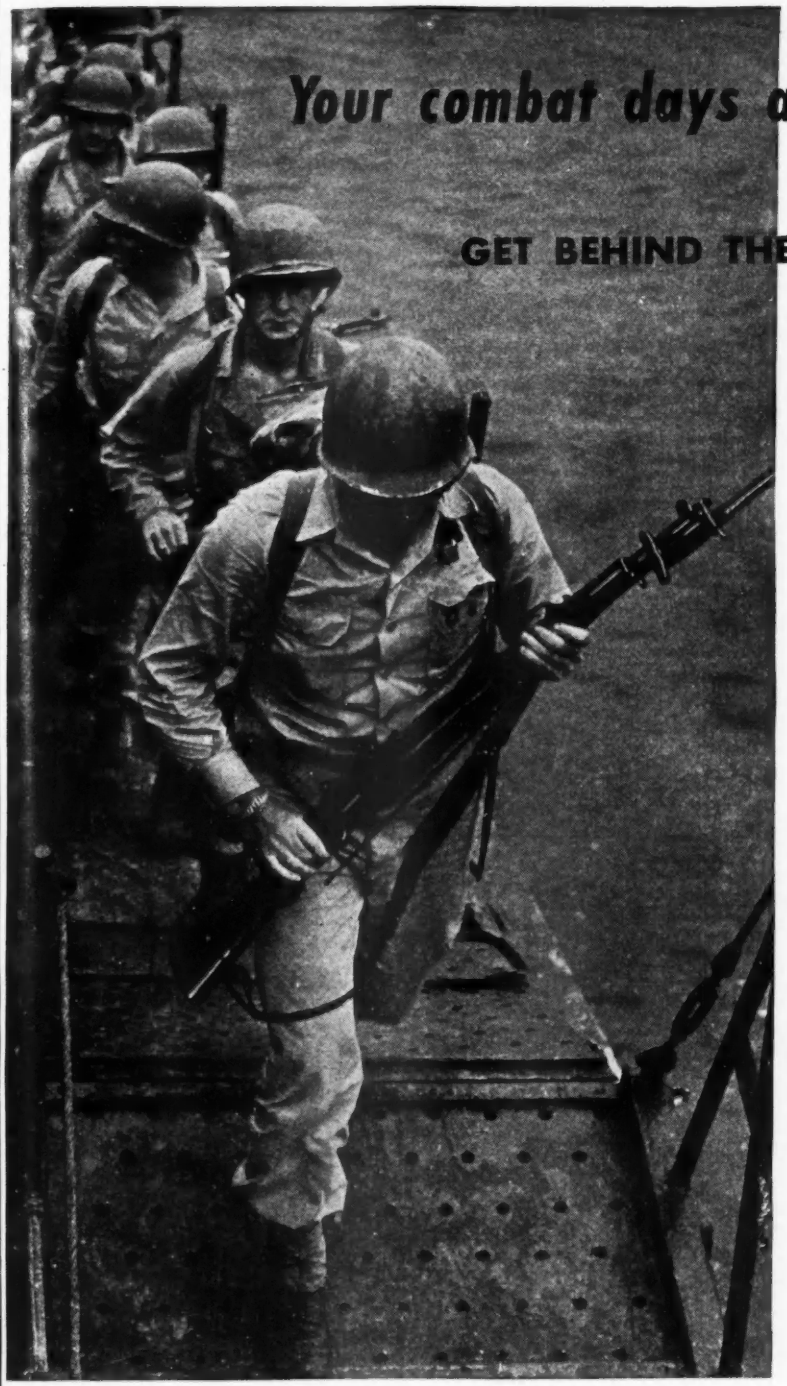
*Write, or ask your Yaun distributor, for information.*

YAUN

DRAGLINE BUCKETS

Patented

Baton Rouge, La.



# Your combat days are not over!

## GET BEHIND THE VICTORY LOAN!

There's plenty of action ahead for fast-thinking industrial leaders in putting over the new Victory Loan! Your Victory drive is important because:

**EVERY VICTORY BOND HELPS TO**

1. **Bring our boys back to the America for which they were willing to give their lives!**
2. **Provide the finest of medical care for our wounded heroes!**

**BOOST THE NEW F. D. ROOSEVELT MEMORIAL $200 BOND!**

Urge all your employees to buy this new Franklin Delano Roosevelt Memorial $200 Bond through your Payroll Savings Plan! At all times better than ready cash, Victory Bonds are industry's "Thanks" to our returning heroes!

START YOUR VICTORY DRIVE TODAY!

Every Victory Bond aids in assuring peacetime prosperity for our veterans, our nation, your employees—and your own industry!

*The Treasury Department acknowledges with appreciation the publication of this message by*

Excavating Engineer

VICTORY LOAN

★ *This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and War Advertising Council* ★

# NOT in the *Contract*

"Mummy," demanded the little girl just returned from Sunday school, where the lesson had been on palaces in the sky, "Mummy, do they have skyscrapers in Heaven?"

"No, darling. They have to have engineers to build skyscrapers."

A high-priced playwright went to Hollywood and was given a plushy office, a salary of $5000 a week and orders to pound out a streamlined drama with religion, high society, dramatic surprise, action, and sex.

Ten minutes later he stalked into the producer's office with the finished product. The astonished producer picked up the page and read: "My God," cried the Duchess to the Bishop, "please stop pinching my leg or I'll slug you."

Mandy: "I can't come to work tomorrow, Ma'am. My little boy is sick."

Ma'am: "Why, Mandy, I thought you said you were an old maid."

Mandy: "I is, Ma'am; but I ain't one of them fussy kind."

A pink elephant, a green rat and a yellow snake walked into a cocktail bar.

"You're a little early boys," said the bartender. "He ain't here yet."

A mother took her seven-year-old daughter to a very progressive, modern school. Among the questions asked was this one: "Are you a little girl or little boy?"

The little girl answered, "I'm a boy."

Well, the teacher went on at a great rate, scaring the poor mother to death by saying the child was psychologically confused, that she should be put with the group of problem children, she wasn't quite bright, etc. On the way home the mother said, "Darling, why did you say you were a little boy?"

Her daughter gave her a long look. "Well, when anybody asks me a dumb question I give a dumb answer."

"This coffee tastes like mud."

"Well, it was ground this morning."

**"Sure they're workin' like beavers, Frenchy there says it was his home and there was a couple bottles of cognac in the basement!"**

Blonde: "Would you call it mental telepathy if we were thinking of the same thing?"

Sailor: "No. Just plain good luck."

"Now tell the court how you came to take the car."

"Well, it was parked in front of the cemetery. Naturally, I thought the owner was dead."

They laughed when I walked in with shorts on, but when I sat down they split.

Braggart: "Yessir, I used to be seen at more first nights than any man in town."

Dora: "Oh, were you a dramatic critic?"

Braggart: "Heck no, a bell-boy at Niagara Falls."

"How many fish you got, Mister?"

"None, yet; but I've only been fishing an hour."

"Say, you're doing all right. There was a feller fished here for two weeks and he didn't catch any more than you got in an hour."

She: "With the laundry situation what it is, I don't see how football players keep their uniforms clean."

Another Silly: "Say, haven't you ever heard of the scrub team?"

Two old settlers, confirmed bachelors, sat in the backwoods. The conversation drifted from politics to cooking.

"I got one o' them there cookery books once, but I never could do nothing with it," said one.

"You've hit it. Every one of them recipes began in the same way—'Take a clean dish.' And that settled me."

During the Sunday morning sermon a baby began to cry at the top of its voice, and its mother carried it toward the door.

"Stop!" said the minister. "Your baby is not disturbing me."

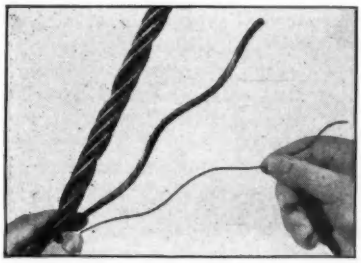
The mother turned toward the pulpit and addressed the preacher: "Oh, he ain't, ain't he? Well, you're a-disturbing him."

Grandpa had been sitting in the corner for hours working away with a pencil stub and a wad of paper. Suddenly he let out a whoop of joy. "Doggone," said he rapturously, "I ain't learned to write."

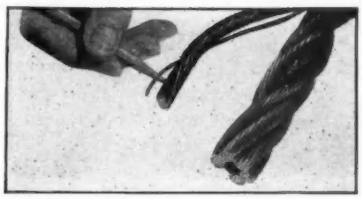
Grandma galloped over and studied the scribbles and scratches. "That's wonderful, Grandpa. What do it say?"

"How should I know, woman? You know I can't read!"

# For maximum safety, service, economy



*All wires and strands* in Macwhyte PREformed are spiral shaped to fit naturally into position. When you select Macwhyte PREformed you get "the correct rope for your equipment," plus a personal interest in helping you get the most out of your rope.



***All Macwhyte PREformed is internally lubricated!*** Macwhyte Wire Rope Lubricant is packed around each wire in all strands. This improves the sliding action of the wires as they move in bending around sheaves and drums. It also protects against inside corrosion.

You make sure of the best when you buy Macwhyte PREformed. It's a rope with less internal fatigue, less friction, better balance and longer life. It's a safer, easier-to-use rope. These extra advantages are acquired through PREforming — every strand is shaped to take its place *naturally* in the rope. Internal stresses are held to a minimum.

The wire that goes into Macwhyte PREformed is processed under constant metallurgical control in Macwhyte's own wire mill. And when this tough, flexible wire is assembled into strands, PREformed and internally lubricated under close supervision of Macwhyte wire rope craftsmen, it just has to be the correct rope for your equipment.

Macwhyte PREformed is especially recommended for your extra-tough jobs, though many wire rope users tell us it pays them to specify this superior rope for all operations. They say its greater life makes it cost less in the long run.

***Get this Macwhyte Wire Rope Catalog!***

170 pages of useful information. A request on your company letterhead will bring it to you promptly. Ask for Catalog G-15.

## MACWHYTE COMPANY

*Wire Rope Manufacturers*

2903 Fourteenth Avenue, Kenosha, Wisconsin

Mill Depots: New York • Pittsburgh • Chicago • Fort Worth • Portland • Seattle
San Francisco • Distributors throughout the U. S. A.

MACWHYTE PREformed and Internally Lubricated Wire Rope...MONARCH WHYTE STRAND Wire Rope . . . MACWHYTE Special Traction Elevator Rope . . . MACWHYTE Braided Wire Rope Slings . . . MACWHYTE Aircraft Cables and Tie-Rods . . . MACWHYTE Stainless Steel Wire Rope, Monel Metal Wire Rope, Galvanized Wire Rope

NO. 837

## *Safe Load Indicator...*

*(Continued from page 586)*

ous amounts of counterweight; and the machine designer may have to develop an A-frame adjustable with boom length to maintain reasonably constant loads in the suspension tackle. These are merely examples and they cannot be dignified to the extent of calling them suggestions. But with the steadily growing emphasis on safety it does not seem unlikely that safe-load indicators may be required by law in the not distant future, and it is not too early to start thinking about their application and limitations.

## *Bridge Canyon Dam...*

*(Continued from page 557)*

site will involve excavation of about 2,130,000 cu. yds. of all classes including nearly 100,000 cu. yds. of tunnel excavation. Excavation for the railroad to the canyon rim is estimated at 300,000 cu. yds.

Another requisite preliminary to the construction of the dam will be the providing of housing for the large forces of construction and engineering personnel. The location of a construction camp or town will be influenced by the access and transportation facilities provided.

Bridge Canyon Dam is designed as an arch gravity concrete dam. Two 50-ft. diameter tunnels 1,600 and 1,900 feet long will carry the flow of the river around the site during construction. Diversion will be accomplished by an upstream cofferdam 130 feet high and a downstream cofferdam 75 feet high. The cofferdams will be of rockfill construction with cylindrical steel cells for cutoffs and will be faced with reinforced concrete on the water sides.

Two 200,000-second-foot capacity spillways, one in each abutment, will discharge flood waters down inclined shafts to the downstream end of the diversion tunnels, the upstream portions of these tunnels being sealed by concrete plugs when diversion is no longer necessary. Control of the discharge will be effected by stoney gates operated from gatehouses located on each abutment just upstream from the dam.

Seven 102-inch diameter outlets through the dam will provide facilities for sluicing silt, to prevent its entrance into the power penstocks, and for regulation of the reservoir.

In the center of the dam is a chamber 70 x 70 feet in section and 600 feet long extending through the dam and a short distance into each abutment to house the power plant which will have six main generating units. Vertical penstocks lead from openings at two elevations in the upstream face of the dam to the power plant. Power plant equipment will be transported through tunnels, one at the top of the dam and one at power plant level, which will be connected by a 25 x 62-ft. elevator shaft in the left canyon wall.

It is estimated that construction will involve open cut excavation of 1,800,000 cu. yds. for the dam, 1,350,000 cu. yds. for the spillways and 650,000 cu. yds. for the diversion tunnels. Other tunnel and shaft excavations will total around 565,000 cu. yds.

Excavation, crushing and transportation of limestone from the Redwall formation at the top of the canyon rim probably will be required to furnish aggregate for the 5,650,000 cu. yds. of concrete for the dam and the 350,000 cu. yds. for the appurtenances. Natural aggregate for concrete to fulfill requirements for the dam is not available within economic distance of the site.

built for the **TOUGH** jobs!

• Jahn heavy duty trailers have long been noted for their ability to handle the *tough* hauling jobs. With rugged in-built stamina, they have the strength to take the strains of heavy overloads without distortion. Rigid cross-braced frame, improved goose-neck construction, spring mounted front and rear axles . . . consider all these finer construction details when you are buying a heavy duty trailer. Write today for full information.

**Now you can get HYDRAULIC BRAKES on Jahn Trailers!**

**C. R. JAHN COMPANY**

**1349 W. 37th Place, Chicago 9, Ill.**

*"Come to Trailer Headquarters"*

**TO ADVERTISE:** All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

**TO INQUIRE:** Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

One Thew Type O, center drive, continuous tread power shovel, equipped with 40 ft. boom, ¾-yd. clamshell bucket. ¾-yd. dipper, part of unit available, now detached. Entire unit in excellent condition.

**The Logan-Long Co.,**
**Franklin, Warren Co., Ohio**

---

Byers Bearcat crane equipped with 30' boom and Hercules gasoline engine. Located Central Indiana. Box 9251

---

1—80-B Bucyrus steam stripping shovel with 2½-yd. bucket, 48-ft. boom, 36-ft. stick in excellent condition. Reasonably priced.
2—1-yd. Marion steam shovels. Type No. 7.

**Benjamin Coal Company**
824 **Richmont St.** **Scranton 9, Pa.**

---

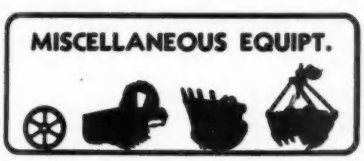
Model 100 Steam railroad shovel on Bucyrus-Erie caterpillar mounting, excellent condition, midwestern location. Box 3112

---

**FOR SALE**

Bucyrus Class 14 Steam Dragline No. 3493. Skid and roller machine equipped with 60' boom and 2 cu. yd. Page bucket. In good operating condition. Inspection invited. Located near Dallas, Texas. Box 3115

---




One 4-yd. type "AX" Bucyrus-Erie dragline bucket, complete with all fittings. Has been used about 45 days. Price $1695. Box 3126

---

Bucyrus-Erie 50B steam 2½-yd. shovel, No. 10635, 26' boom, 17' sticks, manganese rock dipper, steel cab; 100% rebuilt; guaranteed.
Porter, Vulcan 36" ga. steam locomotives, 18 & 17 tons; Milwaukee 8-ton gas (rebuilt).
Vulcan 18-ton steam S/T locomotive, 42" gauge.
Baldwin and Lima-Shay steam locomotives, 58, 56, 50, 42 and 40 tons, std. gauge, (5).
P&H 206B crane, gas, 40' boom, ¾-yd. bkt.
Draglines 2 and 3-yd. Diesel, electric.
American steam railway ditcher-crane, 28' bm.
Gyratory Crushers: 27", 21"; 7" Newhouse.
American-Champion 24" x 50" jaw crusher.
Cedar Rapids travel type asphalt plant.
Euclid 6-yd. bottom dump crawler wagons (8).
Hydroelectric gen. plants, 35', 60', 65' heads.
Gold Placer Dredge, 7½', electric, wood, 28'.
Bucyrus 30' shovel boom only, for 50B machine.
Boiler tubes, 236—1¾" x 5'. ferrules (new).

**H. Y. SMITH CO.**
828 **N. Broadway** **Milwaukee 2, Wis.**

---

Northwest No. 4 rope crowd shovel front, 20' boom, 17' 6" handle, 1-yd. dipper. Condition very good. Location Cocoa, Florida. Box 3124

---

For rent or sale. Galion 101 Motor Patrol Truck crane 35'-0 boom. Now in Chicago. Box 3127

---

1—60 Caterpillar tractor with LeTourneau bulldozer
1—10-ft. Adams grader (leaning wheel)
1—2-yd. Michigan Tömblebug
1—Barber-Greene loader
1—Eagle truck mounted loader
1—Cletrac crawler with end loader
1—½-yd. Speeder crane with dragline; complete with boom and bucket.

**Weldon Laurence**
**Prophetstown, Illinois** **Phone 63**

---

Draglines—3-W, 2-W, also 2 yd. Diesel Cat. Diesel Drags. on trucks, 110-100' booms, 3 and 2 yd. buckets. Adaptable for barge mounting. Crawler cranes, ½-¾-1 yd., 30 to 40' booms. 25 ton Loco. Crane. New 1930, new boiler 1943. 30 ton Diesel Locomotive, std. gauge, new '42. Steel Barge, 100x26x5', sectional. Like new. Athey Mobiloader for D-8 or RD-8 Cat. tractor. Tractors-Dozers, Gas-Diesel, inc. TD18s, A-1. 12 yd. Koehring Diesels; Athey 12 yd. Cats. Scraper and Slackline Hoists, 50 to 150 HP. 75 HP 3 drum Electric Hoist, A.C. Like new. 950' Compressor cpld. to Syn. Motor. Guaranteed.

**James Wood**
**53 West Jackson**
**Chicago 4, Ill.**

---

LeTourneau 12 yd. Model J scraper equipped with four 14x20 tires in rear and two 13.50x 20 in front. Scraper and tires in good condition. Model FD Cletrac diesel tractor, new in October 1941. Recently overhauled. Complete tractor, scraper and spare parts .....$5,600

**HUNTER TRACTOR & MACHINERY CO.**

**327 So. 16th St.**

**Milwaukee 3, Wisconsin**

---

2 Buda MAN diesel engines complete with clutches and radiators size 6½" x 8¾". One Waukesha gas engine 6 MK-124A. One Kohler electric plant 8 KW. 115 or 230 Volts, single phase, 60 cycle. 1½ and 2-yd. backhoe buckets. Parts for No. 10 gas Caterpillar motor patrol. Large stock of diesel and gas Caterpillar heads. Bulldozer blades of all kinds. Inquiries solicited for A.C. Cletracs, International & Caterpillar parts. **Write SAM, 897 Adamson St., S.W., Atlanta, Georgia.**

---

Canvas covers, tarpaulins; truck, boat, machinery; new highest test, full weight; mildew, waterproof; rust proof grommets set in reinforced patches. All sizes. Immediate shipment. Direct factory prices.

**Industrial Mfg. Co.**
**Dept. 32**
**Milwaukee** **Wis.**

---

**FOR SALE**
**SHASTA DAM SAND AND GRAVEL PLANT EQUIPMENT**
**Including**
**GOODYEAR 9-MILE-HAUL 36" SPECIAL CONVEYOR BELTING**
32,000' of Belt Remaining
With Idlers, Pulleys, and Drives
**Also**
Electric Motors, Line Equipment, Transformers, and Supplies
Pendulum Boom Belt Conveyors, 100' and 200'
Merrick Feedoweights and Weightometers
Dorr Hydroseparator, 20'x4'
Marcy Rod Mill, 8'x12'
Vibrating Screens
Dorr Rake and Bowl Classifiers
Extra-heavy Gravel Washer, Trommel type
Pumps: Centrifugal, Deep-well, Steam, Dredge
Auxiliary Equipment: Chain Hoists, Winches, Welding Machines, etc.

Subject to Prior Sale.

**Write, Wire, Telephone Redding 1440**

**COLUMBIA CONSTRUCTION COMPANY, Inc.**
**Box 579** **Redding, California**

---

**FOR SALE**
**Dragline Bucket**
1—3-cu. yd. Type AY Heavy Duty Bucyrus-Erie Dragline Bucket
Box 626 Emporia, Kansas

---

1—50-B Atlas Imperial diesel shovel with 2 shovel booms and 2 dippers.
1—60-ft. dragline boom for same.
1—2-yd. dragline bucket.
1—Gas-air dragline. Requires new motor. Cats just repaired.
1—Shovel boom and dipper for same.

**FOLEY BROTHERS, Inc.**
**Wausau** **Wisconsin**

---

¾-yard Kiesler Model "H" clamshell bucket, Serial No. 635-2657. Excellent condition. Located Texas. Box 3120

---

Low bottom equipment semi-trailer.
1—40 ton 16 wheel
1—25 ton 8 wheel
1 highway dump trailer
2 Fruehauf cattle trailers

**Phone 6417 Reading**

**L. J. Hughe** **422 Chestnut Street**
**Reading, Pennsylvania**

---

**SURPLUS DIPPERS FOR BUCYRUS-ERIE SHOVELS**

2—⅝ cu. yd. Skimmer Scoop Dipper—10-B.
2—½ cu. yd. Drag Shovel Dipper—17-B.
3—⅞ cu. yd. Skimmer Scoop Dipper—17-B.
1—¾ cu. yd. Welded Dipper—21-B.
1—1¼ cu. yd. Cast Front Dipper—GA-3.
1—1¼ cu. yd. Drag Shovel Dipper—33-B.
1—1½ cu. yd. Heavy Duty All Cast Dipper—42-B.
1—1¼ cu. yd. Snow Loading Dipper—10-B.
1—1½ cu. yd. type 4 Med. Duty Dipper.
1—2 cu. yd. Rock Dipper—75-B.
1—2¼ cu. yd. Inserted Type Dipper—50-B.
1—2½ cu. yd. Inserted Type—55-B.
1—2½ cu. yd. All Cast Dipper—55-B.
1—3½ cu. yd. Coal Loading Dipper—75-B.
1—4 cu. yd. Type IV Medium Duty Dipper—100-B.

**F.O.B. Works**
**Write for any further information desired.**

**BUCYRUS-ERIE COMPANY**
**Parts Department**
**South Milwaukee** **Wisconsin**

---

One shovel boom and ¾ cubic yard bucket complete for Lorain 40. Cable crowd shovel. Priced right for quick sale. Box 3121

---

Single rope crowd shovel front end equipment consisting of 13'6" shovel boom, 11' dipper handle and ¾-yd. dipper suitable for 10-B Bucyrus-Erie serial No. 14761 or earlier. Box 9250

---

Two ¾-yd. Bucyrus-Erie AU dragline buckets and one ¾-yd. Page Type M dragline bucket, including all chains and fittings. Located Central Illinois. Box 3119

---

MECHANICS step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a handy form. Fully Illustrated and Easy to Understand. Highly Endorsed. Check the book you want for 7 days' Free Examination. Send No Money. Nothing to pay postman. ( ) Marine $4, ( ) Blueprint $2, ( ) Machinist $4, ( ) Electricity $4, ( ) Shipfitter $1, ( ) Welders $1, ( ) Radio $4, ( ) Plumbers $6, ( ) Diesel $1, ( ) Carpenters $6, ( ) Mathematics $2, ( ) Auto $4, ( ) Sheet Metal $1. If satisfied you pay only $1 a month until purchase price is paid. AUDEL, Publishers, 49 West 23rd St., New York 10, N. Y.

---

Dragline boom, bucket, and attachments for Erie B-2 steam shovel. Box 3128

## WANTED

*(Continued from page 591)*

¾-yd. Michigan truck crane equipped with crane boom or back hoe. Could use ¾-yd. ¾-swing wheel-mounted Bay City crane. Box 3118

Speeder combination loader or shovel on RD-6 Caterpillar tractor.

Dierks Lumber & Coal Co.—Dept. LG
1006 Grand Avenue Kansas City, 6, Mo.

TRAILER

Rogers Lowbed trailer for carrying excavating equipment. Approx. 30 tons capacity. State all dimensions and details. Robert Hawthorne, 1701 North Second St., Philadelphia, Pennsylvania.

Trucks: 15-ton, rear dump, rock bodies, Diesel, 4-wheel drive preferred.
Shovels: One 2½-yd. and one 1-yd. Diesel, late models.
Locomotive: 25-30 ton, std. gauge, gas or Diesel. Box 3117

## HELP WANTED

Experienced construction machinery salesman capable of handling contractors, quarries and governmental bodies. Iowa territory, leading lines, excellent opportunity for the right man. Prefer steady, alert individual under 40, willing to work and make money. Write full qualifications and details to Box 9252.

Dragline Operator wanted by Mining Company in Colombia, South America. In replying state age, draft status, experience, references, etc. Box 9248

CONSTRUCTION SUPERINTENDENTS

wanted by old, well-established contracting firm. Heavy Grading, earth and rock. Drainage, wet and dry. Concrete Paving, highway and airport. Concrete Structures, heavy and highway. Give complete history with reference and qualification for any of foregoing classifications. Box 9249

## POSITIONS WANTED

Experienced operator. Can operate shovel, dragline or clamshell; steam, electric or Diesel powered. 29 years experience, can do own repairs. Excellent references. Married, age 50. Box 9253

# *Notes* from the manufacturers

**Hercules Powder Company** of Wilmington, Delaware, appointed John J. B. Fulenwider as general manager of the cellulose products department and J. B. Johnson as general manager of the explosives department from assistant general managers of their respective departments.

**Klau - Van Pietersom - Dunlap Associates, Inc.,** Milwaukee advertising agency, announces the election of George J. Callos as vice president and account executive.

Mr. Callos was formerly advertising and public relations manager of Allis-Chalmers Manufacturing Company, and last year was chosen by a national group of advertising men as the nation's industrial advertising man of 1944.

**Worthington Pump and Machinery Corporation** of Harrison, New Jersey, has named its executive vice president, Hobart C. Ramsey, to the presidency of a subsidiary, the Ransome Machinery Company.

**R. G. LeTourneau, Inc.,** of Peoria, Ill., plans to build a branch factory in England. Denn M. Burgess, executive vice president, now is in England to select plant properties and inaugurate action on the building program. Robert F. Nelson, newly named assistant to the president, will take as his first assignment the establishment of the new plant this fall.

**Herbert C. Mode,** engineer with the Turner Construction Company of New York since 1924, has been appointed director of personnel for the company, a newly created, full-time post necessitated by increase in the firm's personnel work, J. Archer Turner, president, announced.

# *New* trade literature

Title: **"Kwik-Mix 16-S Dandie"**

Subject: Illustrating every important construction feature, this 12-page book includes description of the tilted flow-line discharge chute and the selective skip shaker of the new three-bag size concrete mixer.

Where to Get: Koehring Company, 3026 West Concordia Ave., Milwaukee 10, Wis. (Free)

Title: **"Reduce Your Hauling Costs with Tournatrailers"**

Subject: Profitable hauling from shovels or draglines is described in this new four-page folder. Prepared for equipment owners and operators, the profusely-illustrated folder shows how rock-hauling costs are cut.

Where to Get: R. G. LeTourneau, Inc., Peoria, Ill. (Free)

Title: **"Industrial Trends".**

Subject: Offers a resumé of new methods, processes, products, raw materials, etc., culled from scientific and trade journals, laboratory reports, and other general sources of information. Issued twice a month, this digest covers all major fields, including engineering.

Where to Get: Industrial Trends, 512 Fifth Avenue, New York 18, New York. (Subscription only)

Title: **"Armco Products for Engineering Construction"**

Subject: Sixty pages cover the story of steel for culverts and other metal products listed in this two-color catalog. Drainage for airports, flood control, power and irrigation, highways, etc., are featured with a series of descriptive bulletins concisely describing each product and application.

Where to Get: Armco Drainage & Metal Products, Inc., Middletown, Ohio. (Free)

Title: **"Pioneer Equipment for Mines, Quarries, Gravel Pits"**

Subject: Crushers, feeders, conveyors, idlers, screens, and dehydrators each receive special descriptive treatment in this new 16-page booklet outlining the features of Pioneer equipment.

Where to Get: Pioneer Engineering Works, Minneapolis 13, Minn. (Free)

Title: **"Illinois 1944 Coal Report"**

Subject: More than 220 pages report on 1944 coal production in Illinois with tables of time, machine mining, employees, accidents, county production, tonnage, etc., along with sand, gravel, limestone, silica, and clay statistics.

Where to Get: Department of Mines and Minerals, Springfield, Ill. (Free)

Title: **"1945 Mining Directory of Minnesota"**

Subject: Maps and charts outline tonnage of ore mines in Minnesota in this Institute of Technology report. Producing mines and reserve properties are listed individually in the handy 233-page book, and a list of companies, operating territories, type of mine, and whether active or inactive are listed.

Where to Get: University of Minnesota, Minneapolis, Minn. (Free)

Title: **"Handbook of Knots"**

Subject: Explaining 428 knots, this handy pocket-size book describes knots used in 48 occupations including those for electricians, riggers and teamsters.

Where to Get: Cornell Maritime Press, New York, N. Y. ($1.00)

Title: **"Bibliography on Open-Cut Mining"**

Subject: This compilation of open-cut mining is so comprehensive covering practically every phase and kind of open-cut methods, that it should be useful to all employing this type of operation. References to 1595 articles are made with brief notations on the contents of each.

Where to Get: University of Utah, Salt Lake City, Utah.

Title: **"Blasting Cap!"**

Subject: A dramatic portrayal of the dangers of blasting caps to children is presented in this 16 mm. sound movie with the purpose of acquainting the public with the dangers of blasting caps. The film is all-color, especially produced for school safety programs but for other groups also. Illustrated posters and leaflets are available for bulletin board use or for discussion groups.

Where to Get: Institute of Makers of Explosives, 103 Park Ave., New York 17, New York. (Free)